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Canada. National Development
Bureau

THE PROVINCE
of
NEW BRUNSWICK
ITS
NATURAL RESOURCES
Developed & Undeveloped

1921,



DEPARTMENT OF THE INTERIOR
CANADA

Hon. SIR JAMES DOUGHEED, K.C.M.G.
Minister

W. W. CORY, C.M.G.
Deputy Minister

Prepared in the
Natural Resources Intelligence Branch
under the direction of
F. C. C. Lynch, Superintendent

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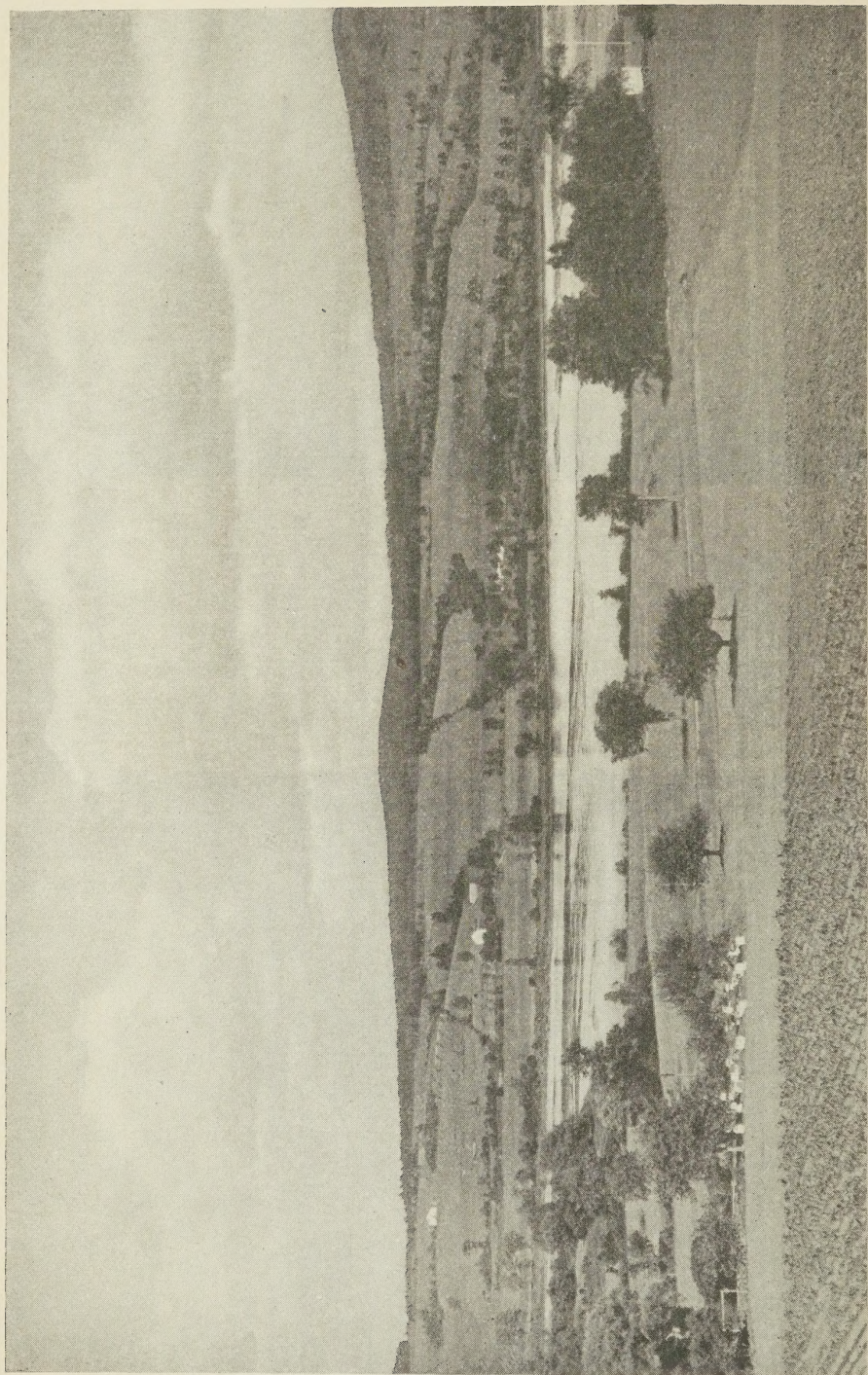
Page 38, line 8 for "traffi" read "traffic".

Page 47, line 15, for "are made" read "be made".

Page 65, line 6, for "upepr" read "upper".

Page 66, for title of illustration read "Crop of strawberries at Sackville".

Page 73, line 51, for "esult" read "result"



The St. John river valley near Woodstock.

The
PROVINCE OF
New Brunswick
CANADA

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DEVELOPED AND UNDEVELOPED

Prepared under the direction of
F. C. C. Lynch, Superintendent
Natural Resources Intelligence Branch

In the preparation of
this pamphlet valuable
assistance has been
rendered by officers of
the several Depart-
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by Federal officers, and
also by Tourist Asso-
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Trade, and Business
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is hereby gratefully
acknowledged.

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CANADA

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1921

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NEW BRUNSWICK

Part I.—GENERAL

INTRODUCTION.

Area and Geographical Position

From the earliest days of European settlement in North America, the province of New Brunswick, previously known as part of Acadia, and later, as part of Nova Scotia, has figured prominently in the romantic history of olden times and has been and is to-day a land famous for its forests, farms, fisheries and shipping. The largest of the Maritime Provinces of the Dominion of Canada, it lies mainly between the 45th and 48th parallels of north latitude and the 64th and 68th degrees of west longitude. It is almost square in shape, its length from north to south being 230 miles and its greatest breadth 190 miles. New Brunswick is bounded on the south by the bay of Fundy and (across an 18-mile strip) by the province of Nova Scotia; on the east by the gulf of St. Lawrence; on the north by Chaleur bay and the province of Quebec, and on the west by the state of Maine, U.S.A. The province is divided into fifteen counties—Charlotte, St. John, Kings, Queens, Albert, Westmorland, Kent, Sunbury, York, Carleton, Victoria, Northumberland, Gloucester, Restigouche, and Madawaska.

New Brunswick's great coast line of about 600 miles and its position on the border of the world's most famous sea-fishing area, makes its fisheries extensive and valuable. The area of the province is 27,985 square miles, or about 17,910,400 acres. This is about five-sixths of the area of Ireland, but the population of New Brunswick is not one-tenth as great, so that it contains immense possibilities of development and offers a splendid field for the industrious settler. It is a rolling country of no great elevation, watered by numerous rivers. The scenery is picturesque and varied, and there are unrivalled opportunities for sport, as a large proportion of the province still consists of one vast forest.

The possession, in St. John, of a splendid ice-free port, offers complete facilities for the disposal by water carriage of the products of the province, chiefly lumber, fish and agricultural produce, and the importation of required goods. Moreover, the closing by ice each winter of the ports of Montreal and Quebec makes St. John and Halifax, Nova Scotia, the two Atlantic winter ports of Canada. St. John, which is nearer Montreal and Central Canada by 275 miles, has become a national port whose yearly trade is second, in Canada, only to that of Montreal.

Physical Features

New Brunswick is situated in the Appalachian region which covers the Maritime Provinces, Gaspé peninsula and the Eastern United States. It is a rolling country full of hills and valleys. Highlands occur in the north in Northumberland, Victoria and Restigouche counties and also along the bay of Fundy, in Kings and Albert counties. Most of the hills are of no great height, although elevations of 1,000 to 1,400 feet above sea-level are found in Kings, and in the mountainous country between the Nipisiguit and Little Southwest Miramichi rivers there is a general level of about 1,300 feet, with peaks rising to 2,600 to 2,700 feet. Mount Carleton, with a height of 2,716 feet, is the highest in the province.

The country is well served by numerous rivers flowing into Chaleur bay, the gulf of St. Lawrence and the bay of Fundy. Of these the most famous and most important is the St. John, with a basin larger than that of any other river on the Atlantic coast from the St. Lawrence to Florida. Draining an area of some 26,000 square miles (10,500 within the province) with its principal tributaries, the Kennebecasis, Nerepis, Oromocto, Nashwaak, Keswick, Tobique, Aroostook, and Madawaska, the St. John, after a course of 450 miles, discharges its flood through a narrow, rocky gorge, where are the famous Reversing falls, into the bay of Fundy.

The tide here ranges from 13 to 30 feet and averages about 26 feet. The minimum summer level of the water surface of the river is 15 feet above low water in the harbour. High water sea level is therefore about 11 feet above the river. The gorge is about 1,200 feet long and 400 feet wide, and its narrow throat does not admit the tide as fast as it rises, nor discharges it as fast as it ebbs in the bay. This causes at every tide the Reversing falls. Navigation between the harbour and the river is possible only for a period of from one-half to one hour, occurring usually after about two and a half hours ebb and three and a half hours flood. The gorge, with its reef, forms a slack water reach, making the St. John navigable for steamers to Fredericton, a distance of eighty-four miles.

Other rivers flowing into Fundy are the boundary river St. Croix and the Maguadavic in Charlotte, and the Petiteodiac and Memramcook in Westmorland county. The east coast rivers are the Restigouche, with branches Kedgwick, Patapedia and Upsalquitch, the Nipisiguit, Miramichi and branches, Richibucto and Buctouche, besides numerous smaller streams.

While lakes are numerous, none are of large size excepting Grand lake, whose area is about 68 square miles. The surface of this lake is scarcely above high tide level of the bay of Fundy, and a small tide is found near its head about seventy miles inland. Among other lakes are the Chiputneticook chain on the St. Croix, the Maguadavic and Oromocto in southern York county, and the south Oromocto and several smaller lakes in eastern Charlotte. Many small lakes are also found around the headwaters of the Tobique, Nipisiguit, and Miramichi.

Geology

The underlying rock of New Brunswick belongs to all geological formations, but the largest area is Carboniferous. This is a great triangular belt whose land margins are along lines running from Bathurst to McAdam Junction, in southern York county, and thence due east until the bay of Fundy is reached at Shepody bay. The rock in this area is mostly sandstone. South of this area are stretches of granite, diorite, etc., particularly in Charlotte county. North of the Carboniferous area is a great slate belt, with large granitic areas in Northumberland, Carleton and southern York. Farther north is a Silurian area, chiefly slates and limestone, but with granite outcrops near Chaleur bay.

The portions best adapted for farming are those underlain by the slates and limestone of the Upper Silurian formations and by the red rocks of the Lower Carboniferous. Of these the former include a large part of the northern division above referred to, while in the area of the latter excellent farming lands are found about Bathurst, in the north, and in the valley of the Tobique, while in the southern part they occur along the valley of the Kennebecasis river and in parts of Kings, Albert and Westmorland counties.

Climate

New Brunswick possesses a climate conducive to a remarkable degree to good health. There is no country more free from epidemic diseases, or where people live to a greater age. Although the northern limit of the province is almost a degree of latitude south of Paris, and while the city of St. John is in the same latitude as Bordeaux and

Venice, yet the climate differs considerably from that of Western Europe. The westerly winds which temper Europe with the warmth of the Gulf Stream reach and cross New Brunswick from the interior of North America and give it a continental climate, with characteristics similar to those of Eastern Europe. Proximity to the sea tempers the climate somewhat, however, so that New Brunswick is not so cold in winter nor so hot in summer as in corresponding latitudes farther inland. The average precipitation (rain and snow reduced to rain) is about 44 inches.

Snow generally comes to stay early in December, although a "green" Christmas is by no means a rarity. January and February are, for the most part, steadily cold with plenty of bright sunshine and occasional mild days or spells. Early in March the increasing strength of the sun brings warmer days and causes the disappearance of the snow, which is usually all gone by the end of the month or very early in April, except in the most northerly inland sections.

The springs are not very early, and operations on the land do not begin until the middle of April and later in the southern and central parts of the province, and not until the middle of May or later in the most northerly parts. The somewhat shorter season in the northern sections is largely offset by the more rapid growth of vegetation although only the hardier crops and those maturing in a little over three months can be grown with safety here.

The summer, while affording abundance of sunshine and heat for the proper growth and maturity of all ordinary farm crops, and many varieties of apples and small fruits, is yet remarkably free from the prolonged dusty, dry spells and hot murky nights so often experienced farther west and south. The regular and sufficient rainfall is ample for full crop growth, and precludes any necessity for irrigation, through any dry period yet experienced, where proper methods of cultivation are followed. The evenings are invitingly cool and enjoyable and are of great benefit in the care of milk in the dairy industry. The equable and enjoyable summer climate of the province attracts an increasing number of people yearly from the heat-oppressed centres of industrial New England to the south.

To aid comparison with climatic conditions in the Prairie Provinces, the following information is of interest. The figures quoted are the average of those for representative points in the respective provinces:—

Province.	Mean Temperature (Degrees Fahrenheit).	Average growing season (May-August incl.) Temperature (Degrees Fahrenheit).	Mean Annual Precipitation. (inches).
Manitoba.....	36.0	59.9	20.0
Saskatchewan.....	36.0	58.0	16.75
Alberta.....	38.8	57.9	16.1
New Brunswick.....	40.8	58.9	43.6

The following table, compiled by the Dominion Meteorological Service, gives the temperature and precipitation during the year 1919 together with the differences from the average:—

METEOROLOGICAL OBSERVATIONS, 1919.

Station. — JANUARY.	Temperature, Deg. Fah.				Precipitation in inches.	
	Mean.	Difference from average.	High-est.	Low-est.	Total amount.	Difference from average.
Bathurst.....						
Chatham.....	16	+ 4	39	-17	3.27	-0.31
Edmundston.....	9		38	-27	4.45	
Fredericton.....	16	+ 3	39	-19	4.37	+0.34
Moncton.....	18	+ 1	48	-15	3.55	+1.14
St. John.....	23	+ 4	46	-13	5.61	+0.81
Williamsburg (Stanley).....	13		35	-21	4.00	
FEBRUARY.						
Bathurst.....						
Chatham.....	23	+ 9	38	- 6	2.08	-0.71
Edmundston.....	14		39	-20	1.85	
Frdericton.....	22	+ 7	41	-16	1.75	-3.91
Moncton.....	22	+ 6	39	0	1.60	-1.18
St. John.....	25	+ 5	40	5	1.85	-2.05
Williamsburg (Stanley).....	18		48	-13	3.00	
MARCH.						
Bathurst.....						
Chatham.....	27	+ 2	49	- 6	4.89	+1.76
Edmundston.....	29		60	-25	1.76	
Fredericton.....	30	+ 4	57	- 8	3.82	-0.90
Moncton.....	29	+ 3	53	1	2.30	+0.09
St. John.....	33	+ 5	54	4	3.21	-1.33
Williamsburg (Stanley).....	26		54	- 5	3.59	
APRIL.						
Bathurst.....						
Chatham.....	39	+ 1	63	20	3.68	+0.93
Edmundston.....	37		69	5	1.44	
Fredericton.....	40	+ 1	65	19	2.95	-0.02
Moncton.....	38	0	62	22	3.15	+0.62
St. John.....	38	- 1	53	20	4.37	+0.86
Williamsburg (Stanley).....	38		61	15	2.45	
MAY.						
Bathurst.....	49	0	75		3.58	+1.21
Chatham.....	50	0	79	28	3.60	+0.78
Edmundston.....	49		78	26	2.84	
Fredericton.....	51	0	79	26	5.28	+2.06
Moncton.....	49	- 1	76	26	4.35	+1.97
St. John.....	49	+ 1	74	35	3.94	+0.23
Williamsburg (Stanley).....	47		77	21	3.46	
JUNE.						
Bathurst.....	61	- 2	92	33	2.45	0.00
Chatham.....	61	+ 1	92	38	1.87	-1.16
Edmundston.....						
Fredericton.....	62	+ 2	90	30	2.33	-1.38
Moncton.....	59	+ 1	87	34	3.35	+0.54
St. John.....	56	0	84	37	2.90	-0.37
Williamsburg (Stanley).....	60		89	30	2.57	

METEOROLOGICAL OBSERVATIONS, 1919.—*Concluded*

Station. — JULY.	Temperature Deg. Fah.				Precipitation inches.	
	Mean.	Differ- ence from average.	High- est.	Low- est.	Total amount.	Differ- ence from average.
Bathurst.....	65	— 5	86	40	2.69	—0.73
Chatham.....	67	0	92	42	2.53	—1.19
Edmundston.....	64	.....	92	37	5.42	.....
Fredericton.....	67	+ 1	93	46	3.22	+0.19
Moncton.....	65	0	87	37	5.48	+2.50
St. John.....	60	0	82	47	4.52	+0.89
Williamsburg (Stanley).....	65	.....	88	44	4.85	.....
AUGUST.						
Bathurst.....	62	— 4	83	41	3.25	+0.02
Chatham.....	64	— 1	85	43	2.55	—1.45
Edmundston.....	63	.....	85	38	1.43	.....
Fredericton.....	62	— 1	83	40	1.95	—2.02
Moncton.....	62	0	80	43	2.10	—1.57
St. John.....	59	— 2	78	47	3.54	—0.32
Williamsburg (Stanley).....	57	.....	82	25	1.08	.....
SEPTEMBER.						
Bathurst.....	54	— 4	80	30	2.33	—0.27
Chatham.....	57	0	79	32	3.81	+0.68
Edmundston.....	55	.....	79	28	3.22	.....
Fredericton.....	56	+ 1	79	32	5.16	+1.62
Moncton.....	55	0	77	32	4.80	+1.91
St. John.....	56	0	75	39	4.81	+1.07
Williamsburg (Stanley).....	51	.....	74	30	3.32	.....
OCTOBER.						
Bathurst.....	40	— 5	64	18	2.51	—0.60
Chatham.....	42	— 3	63	20	2.49	—1.20
Edmundston.....	.....	.....	.....	.....	.....	.....
Fredericton.....	43	0	65	17	4.22	+0.15
Moncton.....	41	— 4	63	19	3.25	—0.02
St. John.....	45	0	64	24	3.86	—0.68
Williamsburg (Stanley).....	40	.....	63	15	2.80	.....
NOVEMBER.						
Bathurst.....	34	+ 1	57	8	3.89	+0.65
Chatham.....	28	.....	61	4	.....	.....
Edmundston.....	34	+ 1	58	2	5.51	+1.44
Fredericton.....	35	+ 1	60	6	3.37	+0.11
Moncton.....	37	0	52	14	5.99	+1.58
St. John.....	29	.....	54	2	2.84	.....
Williamsburg (Stanley).....	.....	.....	.....	.....	.....	.....
DECEMBER.						
Bathurst.....	12	— 7	39	—26	1.29	—1.89
Chatham.....	10	.....	40	—31	0.56	.....
Edmundston.....	12	— 7	41	—26	2.75	—0.70
Fredericton.....	13	— 9	47	—21	1.92	—0.69
Moncton.....	19	— 5	46	—17	3.55	—0.62
St. John.....	8	.....	54	—30	2.19	.....
Williamsburg (Stanley).....	.....	.....	.....	.....	.....	.....

Climatology

By A. J. CONNOR, *Climatologist of the Meteorological Service of Canada.*

The usual procedure in publications of this nature is to state the differences of the meteorological factors from their average or normal values, and afterwards to translate these differences into verbal characterizations of the weather. There is no doubt that this method of analyzing the weather of a period becomes somewhat unsatisfactory as the period increases in length since the levelling action of taking the "means" smooths out of existence many of the extraordinary values of the meteorological factors which may have prevailed for a few days or a week, values, however, which may have had a great influence on the crops. These monthly means as well as the normal values at certain meteorological stations in New Brunswick are included in this chapter, but in the present article I wish to describe another method of presenting the principal meteorological factors. So far as I am aware no such method has ever been used by anyone else, and I do not present it now as being above criticism, but as a new departure which may be improved and which illustrates graphically the basic factors of climate as they affect average farm crops.

In brief, the end desired was to be able to combine the maximum and minimum temperatures with the rainfall so as to yield an index number for the month. But the use of the mean maximum and minimum temperatures was soon seen to be undesirable, for the reason that a few days with extraordinary temperatures at one time in the month may entirely counterbalance other days with extraordinary temperatures whose differences from normal are of contrary sign. The counterbalance is, of course, mathematically correct, but it is very doubtful indeed whether extremely hot days remedy any damage which a growing crop has suffered by reason of low temperatures at an earlier date. In the case of a crop which has been damaged by frost, for instance, it is obvious that there is no corrective quality in subsequent great heat. And a consideration of the possible intermediate stages between these extremes leads us naturally to the idea of an optimum temperature—the temperature at which plants grow best. The optimum temperature differs with the plant to a considerable extent, as, for instance, weather that is too cool for corn is excellent for potatoes, but may not be cool enough for turnips. The temperature to be chosen in forming the monthly index, must, therefore, be a compromise forced by the varied nature of the crops produced in New Brunswick. The temperatures finally chosen were those above the limits shown in the following table:—

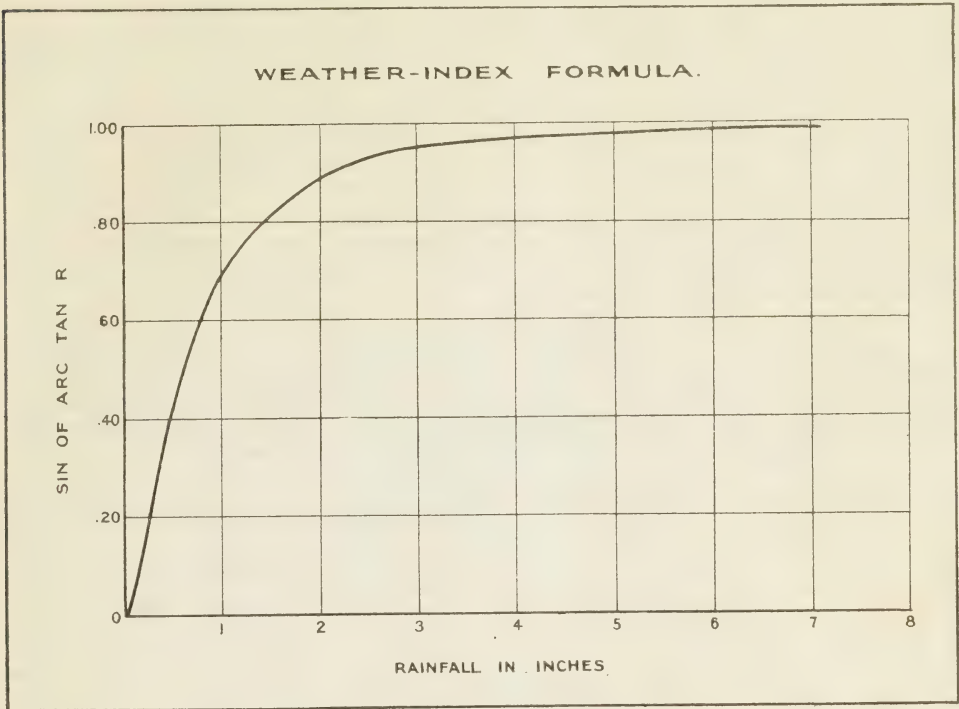
	April.	May.	June.	July.	August.	September.
Day—lower limit	60	60	70	70	70	60
Night—lower limit	43	43	50	50	50	43

For each station the number of days with a temperature equal to or exceeding the limit in the respective months was counted and tabulated, and also the number of nights in which the temperature did not fall below the assigned limit. In effect, this procedure measures the number of days which received a sufficient quantity of heat, and gives no weight to heat in excess. The numbers thus obtained are to be found in the table.

In regard to the rainfall, it may be said that for crops usually grown in this province, the efficiency of the moisture thus obtained in promoting growth increases rapidly and directly with the rainfall at first; but after the rainfall has reached the neighbourhood of four inches for the month, it is evident that normally a much smaller additional quantity will suffice to maintain the soil in a condition sufficiently moist for agriculture. Some method of weighting the rainfall figures is, therefore, required which will give the greatest weight to increase in rainfall below some assigned limit and little or no weight to increase above the same limit.

The method adopted, although excessively simple of itself, is not clear without reference to the accompanying diagram. The rainfall totals (for each month) may be considered as ranging upward from zero without limit and it is therefore always

possible to find an arc of which the rainfall total is the natural tangent. Thus, for example, if the rainfall be 0.30 inch, we have 0.30 as the tangent of $16^{\circ} 42'$, or if the rainfall be 4.50 inches, the corresponding angle is $77^{\circ} 28'$. Further, after the corresponding arc is found, we can always determine its natural sine. Thus in the examples now quoted, the sines of $16^{\circ} 42'$ and $77^{\circ} 28'$ are known respectively to



Weather-index formula.

be 0.287 and 0.976. The final measure of the influence of the rainfall of 0.30 inch is 0.287 and of 4.50 inches is 0.976. A reference to the diagram will show how rapidly the measure increases with the rainfall at first, but that after the rainfall has reached what we assume to be near the optimum amount, the measure becomes practically constant.

It now remains to combine the figures obtained from temperature and from rainfall, together. This is done by means of a triangle. Let one side of the triangle have units of length equal in number to the number of sufficiently warm days, and let another side have units of length corresponding to the number of sufficiently warm nights. If the angle between these two sides be the angle whose tangent is the rainfall, then the area of the triangle is equal to the product of those two sides into half the sine of the included angle. Or more briefly,—

$$\text{INDEX-AREA} = F_d \times F_n \times \frac{1}{2} \text{Sin arc tan } R.$$

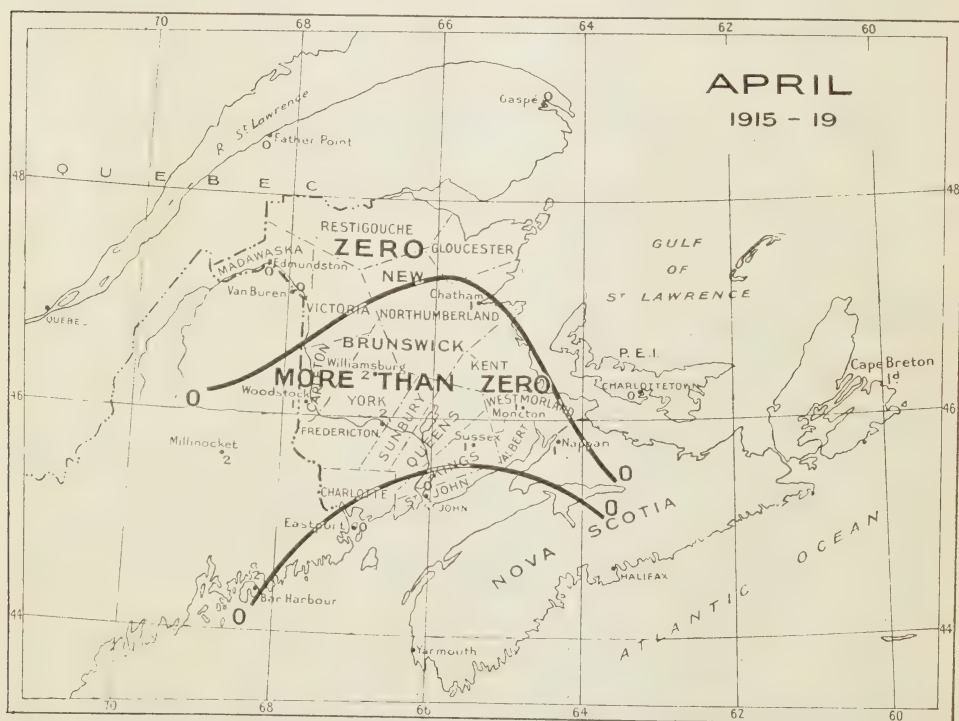
where F_d is the frequency of warm days, and F_n the frequency of sufficiently warm nights, and R is the total rainfall for the month. Now, since the frequencies and the rainfall are variable for the months and for the stations, we shall obtain a series of areas, which may be entered on a map and differentiated by lines in the usual manner.

It should be noted that if any one of the factors be zero, then the index will be zero. For instance, no matter how warm the month may have been if there has been no rainfall, then the index is zero. Similarly if all the nights have been too cold the index is zero. Such cases will not occur except at the beginning or end of the growing season or in regions lying outside the limits of successful agriculture.

By this method a number of cold days in a month is not counter-balanced by a number of days of great heat, as in the taking of a mean temperature, but the number of too cool days is definitely counted out by this system, while the excessively hot days are counted only as days with sufficient heat. Moreover, since high temperatures and low rainfalls are to a certain extent correlated, periods of great heat being often very dry, an excessively hot month will not in general have a large index-number; for the reason that since the rainfall factor (sin arc tan R) is always less than unity, and decreases rapidly for decreases in rainfall, the product $F_d \times F_n$ will generally in cases of great heat be multiplied by a very small decimal.

On the accompanying maps the resulting figures for the growing season as determined over the five years 1915-19 inclusive have been graphically differentiated. They are now considered seriatim.

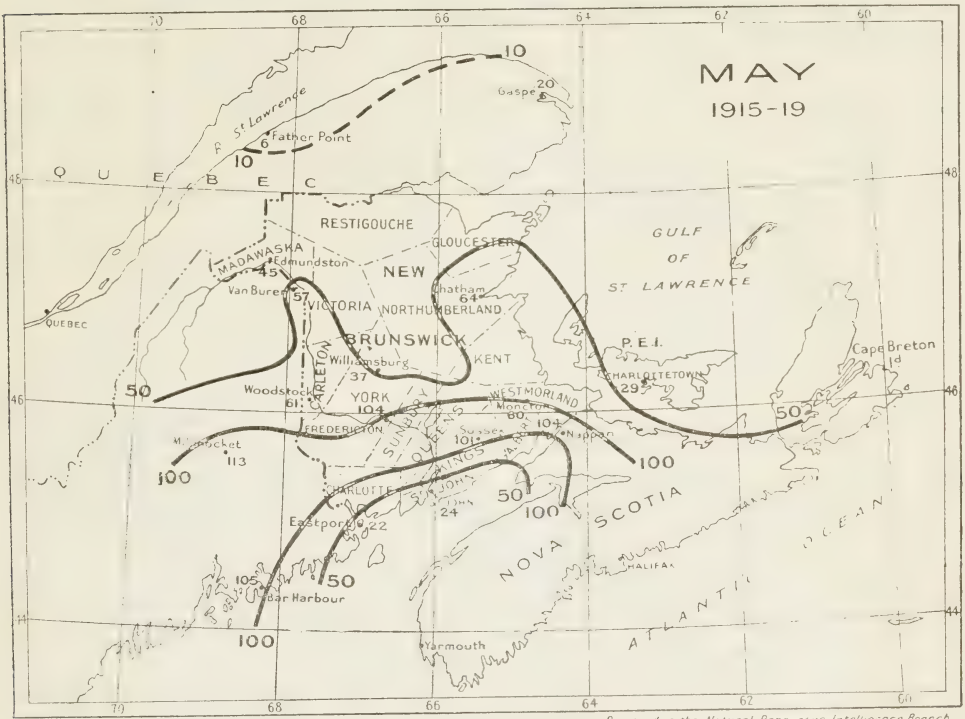
April.—In this month only northern and extreme southern New Brunswick have index values not more than zero. That is to say, only in these portions of the province were all the nights colder than the assigned lower limit of temperature, during the last five Aprils. The indices in these cases are zero. This map then shows that spring "opened earlier" in central than in northern New Brunswick.



Prepared in the Natural Resources Intelligence Branch

Weather-index for April.

May.—If we take the index 100 as representing the lower limit of assured growth in this month (this is taken only as a tentative approximation to the truth and is subject to further investigation) the May map shows that the strip from the Nova Scotia boundary westward to the state of Maine experienced favourable meteorological conditions and that all plants indigenous to a cool climate made satisfactory progress

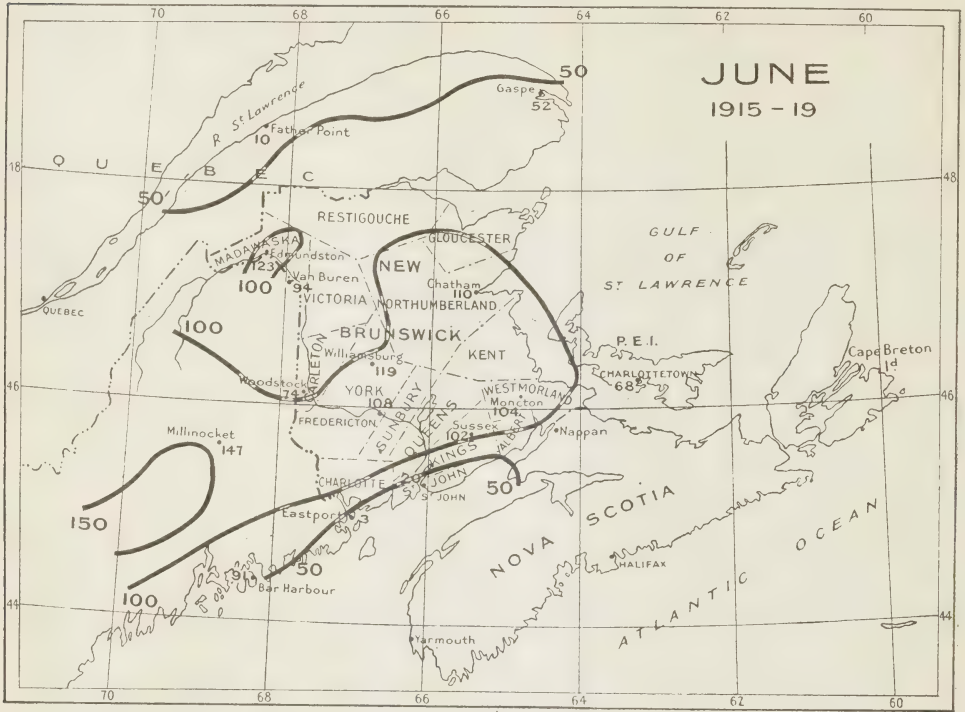


Prepared in the Natural Resources Intelligence Branch

Weather-index for May.

after sowing, or in the cases of grasses and the like, after resumption of growth. Central and northern New Brunswick did not experience as favourable conditions as the eastern and western portions of the province and the strip of country above-mentioned, or at least did not experience them for any length of time.

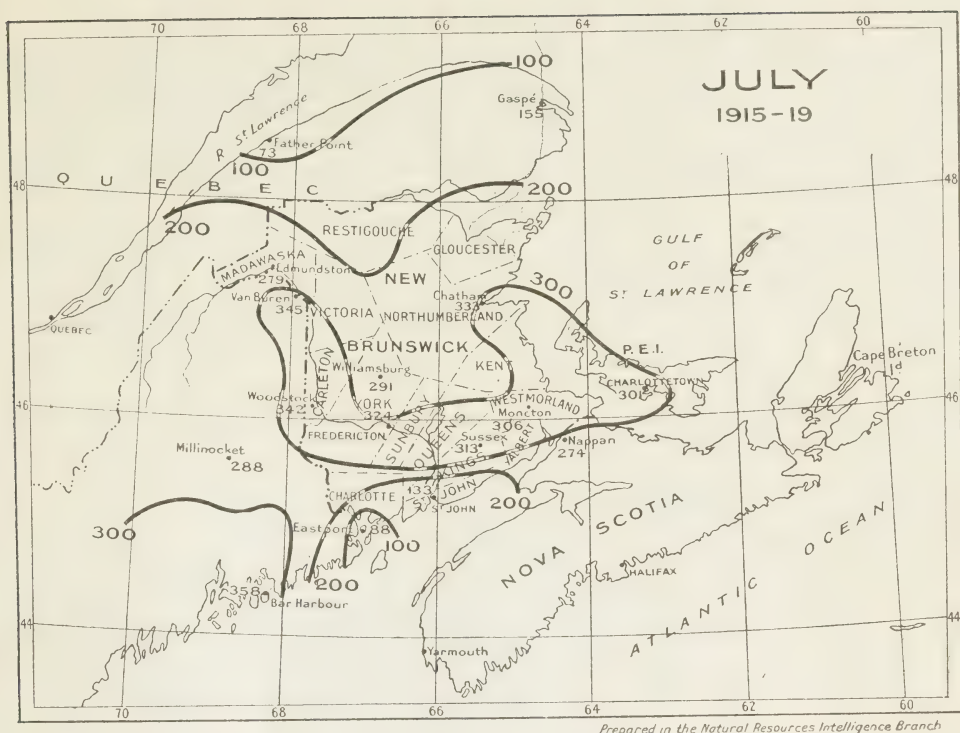
June.—In this month the values of the temperature limits are shifted in forming the indices from 43° and 60° to 50° and 70°. The indices for June are therefore not strictly comparable with those of April and May. Yet comparison with known climatic facts indicates that the values are fairly uniform with those for earlier months. In the favoured area we may then include most of the eastern, southern and central portions of the province and an area about Edmundston. A small area on the shores of the bay of Fundy show conditions to have been backward for all but plants satisfied by the coolest weather.



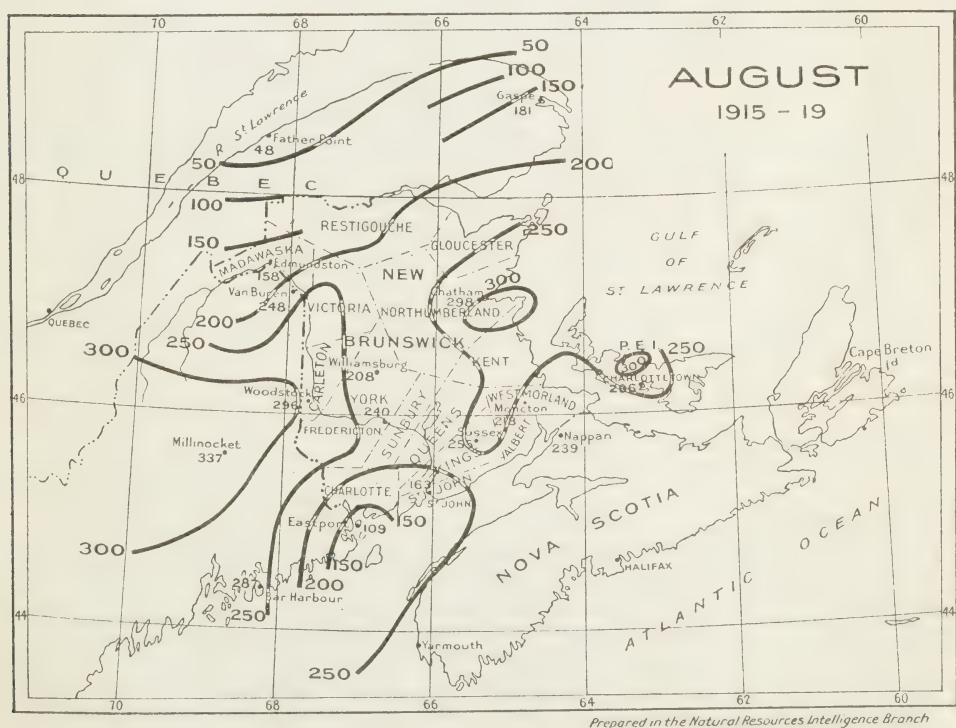
Prepared in the Natural Resources Intelligence Branch.

Weather-index for June.

July and August.—These are the summer months and high indices are shown throughout the province. The effect of the cool waters of the bay of Fundy in delaying the rise in index values is a noteworthy feature.

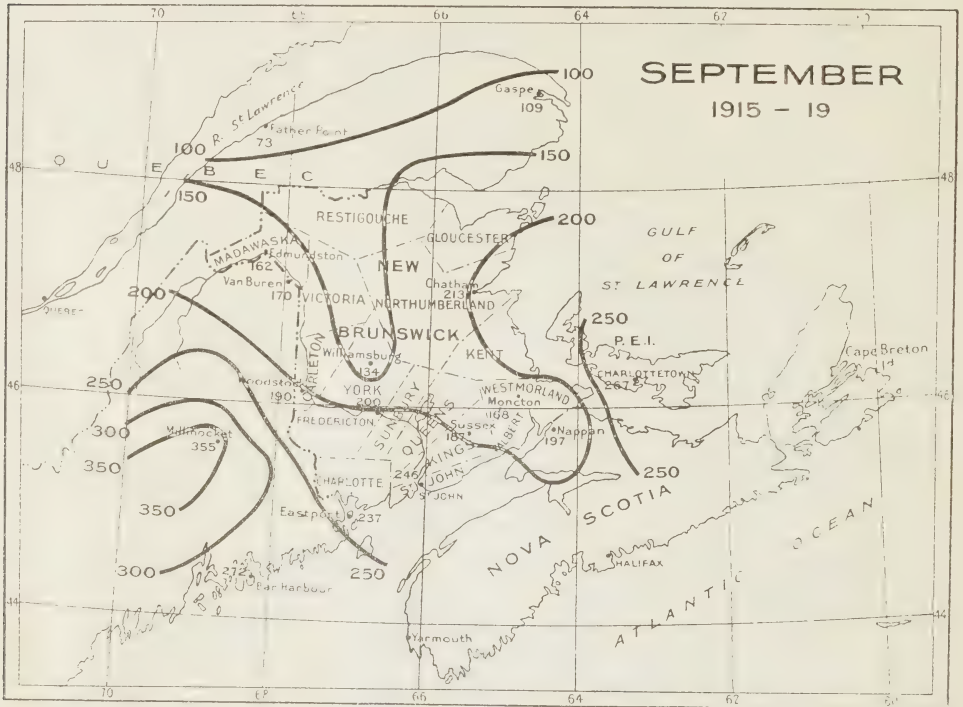


Weather-index for July.



Weather-index for August.

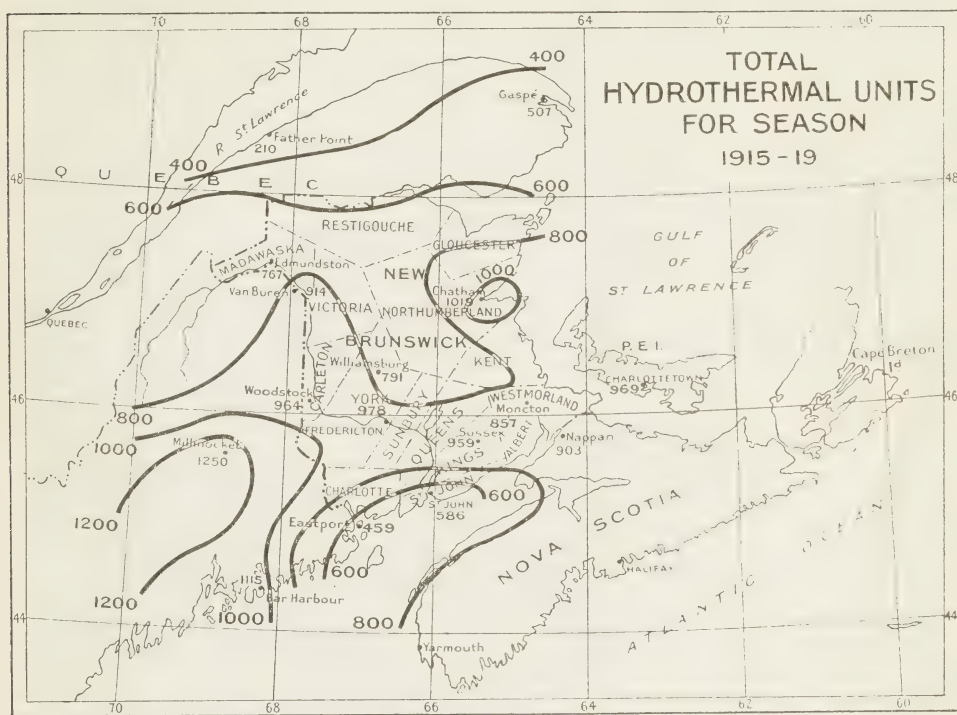
September.—The indices for this month are still high for the major part of the province. A consideration of values obtained for areas farther west in Canada shows that autumn is late in New Brunswick and unusually favourable for crops. That this is due to proximity to the sea is indicated by the shores of Fundy, which in previous months showed a slow rise in values but in September have the highest in the province.



Prepared in the Natural Resources Management Branch.

Weather-index for September.

Season.—This map gives a basis for estimation and comparison of climatic values at various points. That it is in general accord with what is known by experience as to suitability of climate for agriculture, is apparent. Of course these values are quite independent of the nature of the soil, which is an important additional factor. It should, however, be noted that very few observations of temperature and precipitation have ever been made in the northern interior of the province, and that the maps might be considerably changed in the counties of Northumberland, Gloucester and Restigouche should numerous observing stations be opened there and the necessary data be secured. It is interesting to note that all new lands being opened for settlement have values well above those of some other districts where farming is known to be successful. One of these, the Blue Bell Settlement, is well within the climatic belt which contains all the best agricultural areas in New Brunswick.



Prepared in the Natural Resources Intelligence Branch

9

Total hydrothermal units for season.

History

The authentic history of New Brunswick begins in 1534 when Jacques Cartier first sighted its shores at Escuminac point about 35 miles from Chatham and landed somewhere near. But it was not until 1604 that the coast was carefully explored. On June 24 of that year Samuel de Champlain and de Monts discovered, to quote from Champlain's narrative, "one of the largest and deepest rivers that I had yet seen, which I called the river St. John because it was on that day that I arrived there." During the following winter, Champlain, de Monts and eighty companions lived on Dochet island at the mouth of the St. Croix. Here was issued a series of papers under

the title *Maitre Guillaume*, "in order that the spirits might be sustained by sundry pleasantries." There is no question but that this was the forerunner of all the journals of this continent.

During the next forty years numerous expeditions came out to Eastern Canada, among which may be mentioned those of Sir William Alexander (1621) Claude and Charles La Tour, d'Aunay de Charnisay, Nicolas Denys and Villebon. It was during this period that the famous episode occurred of the intrepid defence by the wife of Charles la Tour of their fort, which stood where now is Fort Frederick, West St. John.

Throughout the 17th century contests for this territory between the English and French were frequent, until in 1710 the former were victorious and three years later obtained Acadia by the treaty of Utrecht. Afterwards what is now New Brunswick was disputed territory as a result of conflicting contentions as to whether or not it was part of Acadia. Finally in 1756 an expedition under General Moncton cleared the St. John river. In 1761 the Tantramar marsh lands about Sackville which had been tilled by the French were colonized by English settlers from Connecticut and Massachusetts. In 1762 the settlements of Maugerville, Sheffield and Gagetown were established, all newcomers being from New England. This movement rapidly extended. Settlements by Scotch and English at Bathurst and other points along the Gulf coast were started about 1764. In the following year the territory became the county of Sunbury in the province of Nova Scotia, and was accorded representation in the House of Assembly at Halifax.

Shortly afterwards the American Revolution broke out, during which the settlement at the mouth of the St. John was loyal. The province remained a British colony and when in each of the United States edicts of banishment and laws of confiscation were passed against the persons and property of those who had remained faithful to the British government during the war, these loyalists, of whom there were about 70,000, came chiefly to Canada. On May 18, 1783, twenty vessels arrived in St. John harbour and disembarked nearly 3,000 people. The landing was in West St. John, at the foot of the street fittingly called "King." The following year saw over 9,000 loyalists in St. John.

In this year that portion of Nova Scotia north of the Missaguash became a new province under the name of New Brunswick. Its first governor was Thomas Carleton, who formed an executive government with a council of nine members. St. Ann's point on the St. John river opposite Fort Nashwaak which had a century before been the seat of government of Acadia was chosen as the capital and named Fredericton. The first session of the legislature of the province to be held in the new capital convened in 1788 in a building still in existence on what is now Queen street. The first sessions of the legislature elected in 1785 had been held in the newly-established city of St. John.

The Napoleonic wars and that of 1812 with the United States retarded the progress of the province and harassed its shipping. In these days the St. John river played an important part as a military route to Quebec by way of the Madawaska river, lake Temiscouata and Rivière du Loup. In 1812 the 104th New Brunswick regiment marched to Quebec on snowshoes in the depth of winter. The distance of 435 miles between St. John and Quebec was accomplished in 16 days, or an average of 27 miles a day without the loss of a man. In 1837 this feat was repeated in almost the same time by the 43rd Light Infantry.

The first steamboat to run on the St. John was the *General Smyth*, which inaugurated a service in 1816 between St. John city and Fredericton. The *Saint John* was the first steam craft to cross the bay of Fundy. On its maiden trip in 1827 it anchored in Digby harbour amid great excitement. The year 1825 was marked by several disastrous fires, the worst of which was that on the Miramichi, as a result of which tremendous areas of forest land were burned over and 160 persons killed.

The progress of the province in the next forty years was steady and permanent. The principal questions of general interest were concerning the boundary line between

New Brunswick and the state of Maine, responsible government, and the reciprocity treaty with the United States. The boundary line was one of the questions not finally disposed of at the treaties of Versailles and Ghent, and as regards New Brunswick and the state of Maine there were continuous disputes and strife. In 1839 there was probability of war between the disputants and military preparations were made by both sides. However, negotiations were renewed and resulted in the Ashburton treaty of 1847 which established the boundary as it is at present.

Early Government

The early government of New Brunswick was not all that could be desired, either in theory or practice. The members of the House of Assembly were duly elected by the freeholders of the different counties they represented, but the popular voice had little authority. The Governor, appointed by the British Government, claimed that he was responsible solely to the Colonial Office in London, and, with the assistance of a number of gentlemen selected by him, but whose advice he did not always take, he ruled the province. The Crown Lands remained the property of the King and their management was solely in the hands of the Colonial Office. Large tracts of land were reserved for the purpose of securing timber for the masts of naval vessels. This area was out of all proportion to the requirements of the navy and materially interfered with the settlement of the country. This condition together with mismanagement of the Crown Lands had reached such a pitch in 1829 that even the Council joined the House of Assembly in an address to the King on the subject. As a result, the control of these lands was vested in 1837 in the House of Assembly who, in return, undertook a nominal provision towards the expense of the civil list which included the salaries of the Lieutenant-Governor, judges and other officials.

However, the Governor still continued to claim and exercise the royal prerogative in many ways unacceptable to the people and it was not until 1855 that continued agitation resulted in a full measure of responsible government being granted to the province.

The next great question to occupy the attention of the people of New Brunswick was that of confederation. This matter, which for some time previously had been discussed in the Nova Scotia and Upper and Lower Canada legislatures, was considered in the New Brunswick Parliament in 1862-64, and in the latter year the Government was authorized to enter into negotiations and hold a convention for the purpose of effecting a union of the Maritime Provinces. The convention of these provinces was held at Charlottetown, P.E.I., in 1865 and was attended by a strong delegation from Upper and Lower Canada who urged the larger union. The convention adjourned to Quebec where all the colonies of British North America were represented, and a scheme of union was prepared. This was rejected by the people of New Brunswick in a general election held in 1865, but the Government elected to oppose confederation resigned. A second election proved that the general feeling had changed and in the new legislature in 1866 a resolution favouring the union was carried by a vote of 30 to 8.

Similar action having been taken by the other colonies with the exception of Prince Edward Island, and the measure to bring confederation into being having been drafted, it was passed by the Imperial Parliament on March 29, 1867, as the British North America Act, and on July 1 of that year the Dominion of Canada came into existence. Prince Edward Island entered the Dominion in 1873, but Newfoundland has not done so. This Act is the Canadian constitution. There have as yet been no important amendments, so that the system of government of New Brunswick is still virtually the same.

Progress throughout the last half century has been gradual but steady. More and more of the land is being brought under cultivation. The most notable developments have been the opening up of the country by railways and the growing importance of St. John as a national winter port of Canada.

Population

The population of New Brunswick was estimated in 1919 to number 369,000. There was no census prior to 1824, and estimates of population before that time were largely guess work. The latest census was held in 1911. The following table shows the growth in population in the province:—

1782 Estimate.....	800	1851 Census.....	193,800
1783 ".....	11,457	1861 ".....	252,047
1817 ".....	35,000	1871 ".....	285,594
1824 Census.....	74,176	1881 ".....	321,233
1834 ".....	119,457	1891 ".....	321,263
1840 ".....	156,162	1901 ".....	331,120
		1911 ".....	351,889
		1919 Estimate.....	369,000

AREA AND POPULATION BY COUNTIES.

Counties.	Area in acres.	Population in 1911.			Per square mile.	Population in 1901.
		Male.	Female.	Total.		
Whole province	17,910,400	179,867	172,022	351,889	12.61	331,120
Carleton.....	838,785	11,034	10,412	21,446	16.36	21,621
Charlotte.....	821,376	10,774	10,373	21,147	16.48	22,415
Gloucester.....	1,196,676	16,588	16,074	32,662	17.47	27,936
Kent.....	1,137,931	12,435	11,941	24,376	13.71	23,958
Kings and Albert.....	1,345,110	15,470	14,815	30,285	14.41	32,580
Northumberland.....	3,033,985	16,150	15,044	31,194	6.58	28,548
Restigouche.....	2,092,595	8,434	7,253	15,687	4.80	10,536
St. John city and county....	394,163	26,082	27,490	53,572	86.98	51,759
Sunbury and Queens.....	1,618,742	8,986	8,130	17,116	6.77	16,906
Victoria and Madawaska....	2,153,549	15,086	13,136	28,222	8.39	21,136
Westmorland.....	922,993	22,703	21,918	44,621	30.94	42,060
York.....	2,307,367	16,125	15,436	31,561	8.75	31,620

Of the total population of the province in 1911, 252,342 is classed as rural and 99,547 as urban. The number of dwellings is given as 60,930, and the number of families as 67,093, with an average of 5.2 persons per family. Those born in Canada numbered 333,576; born in the British Islands, 8,729; in other British possessions, 1,430; in Europe, 2,052; in Asia, 257; in the United States, 5,766, and in other places 79. The number of male persons is given as 179,867, and females as 172,022, showing an excess of 7,845 males. The war casualties, however, have probably changed these figures somewhat. The number of Indians is given as 1,846 in 1917. These are of the Micmac tribe.

ORIGINS OF THE PEOPLE.

The people of New Brunswick are mostly of English, Scotch and Irish origin, but there are also many thousands of descendants of the original French colonists or Acadians. These latter are settled mostly along the shores of the gulf of St. Lawrence in the counties of Gloucester, Kent, and Westmorland, and are engaged chiefly in the fishing and fish canning industries. The northern portion of the province, particularly the county of Madawaska, contains a considerable number of French Canadians from the neighbouring province of Quebec. The English-speaking majority is composed mainly of the descendants of United Empire Loyalists who came from the United States at the time of the revolution there, and of settlers who since that time have been coming direct from the British Isles. The tide of immigration which of late years had passed over Eastern Canada on its way to the western plains, now favours New Brunswick again, whose opportunities are now more apparent and development more rapid than previously. The province is predominantly English-speaking, and contains no problems of assimilation of alien races, nor lack of congenial society to incoming settlers of English speech.

GOVERNMENT ADMINISTRATION AND FINANCE

System of Government

Canada is a self-governing dominion in the British Empire and a member of the League of Nations. Combined with having the status of a nation, she enjoys important benefits through being an integral part of so powerful a world-wide commonwealth. But the link that binds her to the mother country, though strong in sentiment on both sides, is yet in every other way the lightest possible.

Officially, Canada places her highest authority in the Sovereign, represented at Ottawa by the Governor General. Her Government is modelled, as far as possible, after that of Great Britain, whose constitution, the result of centuries of growth, is generally admitted to be most satisfactory. Nominally the Sovereign rules, but in reality government is carried on by the representatives of the people. The leader of the Cabinet, usually called the Prime Minister, is in reality the actual head of the country's affairs, the Governor General acting only on his advice.

The Government of Canada, called the Federal Government, is, as stated above, very similar to that of Great Britain. The King is represented by the Governor General. Parliament consists of two chambers, the Senate and the House of Commons. The members of the Senate are chosen for life by the Governor General on the advice of his ministers. The Commons are elected by the people every five years, or at lesser intervals should Parliament for any reason be dissolved within that time. An exception to this rule was made during the war when the life of Parliament was extended to six years because of the unusual conditions.

The leader of the political party having the majority in the House of Commons forms a Government, choosing a number of his party, as a rule from the Commons though sometimes a few from the Senate, to form a Cabinet. He heads the Cabinet as Prime Minister or Premier, and the other members take charge of the various departments of the Government's business, being styled ministers. They carry on the business of the country for a term of five years, after which Parliament is dissolved and a general election held. The election may be brought on, however, before the five-year term is up. Should the Government lose the confidence of Parliament and suffer a reverse on the floor of the Commons, or lose the confidence of the people and fail to have a majority of supporters elected at a general election, the Governor General receives their resignation and calls on the leader of their opponents (called the Leader of the Opposition) to form a new Government.

This form of government has been in existence since the Dominion of Canada was formed by the confederation of the colonies of Upper and Lower Canada (Ontario and Quebec), Nova Scotia, and New Brunswick, on July 1, 1867. Its constitution is set forth in the British North America Act. Each province has representation in the Commons in proportion to its population and the members of the Senate are chosen along pretty much the same lines. New Brunswick has ten representatives in the Senate and eleven members in the House of Commons. The provinces then have individual governments of their own.

The Provincial Governments are formed along lines similar to the Federal Government. At the head, and representing the Federal Government, is a Lieutenant-Governor appointed by the Governor General for a term of five years. His duties in the province correspond to those of the Governor General in the Dominion. Though nominally head of the province's affairs, he acts on the advice of his Government. It is his duty, however, to veto any Act which in his opinion might be detrimental to the interests of the Dominion at large. The Government of this province consists of one House only, elected by the people, and called the Legislative Assembly. A second chamber, the Legislative Council, was abolished in 1892. From this Assembly the Lieutenant-Governor calls upon the leader of the party having a majority of supporters to form an Executive Council, the leader being the Premier. This Council, like the

Federal Cabinet, carries on the business of the province. The Legislative Assembly of New Brunswick now consists of forty-eight members. The Executive Council consists of the Premier and eight other ministers.

The Assembly has control of legislation and matters especially affecting the province while the Federal Government controls matters of a wider nature. In order that there should be no doubt the British North America Act set forth the following list of subjects to which the exclusive authority of the Federal Government extends: (1) The public debt and property; (2) trade and commerce; (3) the raising of money by any kind of taxation; (4) the borrowing of money; (5) the postal service; (6) the taking of the census; (7) military and naval matters; (8) the payment of the officials employed by the Government; (9) lighthouses; (10) navigation and shipping; (11) quarantine and marine hospitals; (12) fisheries; (13) ferries, except when entirely within a province; (14) currency and coinage; (15) banking and the issue of paper money; (16) saving banks; (17) weights and measures; (18) bills of exchange and promissory notes; (19) interest; (20) legal tender; (21) bankruptcy; (22) patents for invention; (23) copyrights on books, pictures, etc.; (24) Indians and Indian lands; (25) naturalization of foreigners; (26) marriage and divorce; (27) the criminal law; (28) penitentiaries; (29) matters expressly stated in the Act as not assigned to the province.

Those subjects over which the province was given legislative authority are set out in the following list:—

(1) The amendment of the constitution of the province, except in regard to the office of Lieutenant-Governor; (2) direct taxation; (3) the borrowing of money on the sole credit of the province; (4) the civil service of the province; (5) the public lands, belonging to the province; (6) the prisons and reformatories of the province; (7) hospitals, asylums, and charitable institutions; (8) municipal institutions; (9) licenses, such as those of taverns, shops, and auctioneers; (10) local works and undertakings, except lines of steamships, railways, canals, telegraph, and other works and undertakings extending outside the province, and such works which, although wholly inside the province, are declared by the Dominion Parliament to be for the general advantage of Canada, or of two or more of the provinces; (11) the incorporation of companies for business in the province; (12) the solemnization of marriage in the province; (13) property and civil rights in the province; (14) the administration of justice in the province; (15) punishment by fine and imprisonment, in case any provincial law is broken; (16) generally all matters of a merely local or private nature in the province.

By a further provision in the British North America Act, the legislature of each province may exclusively make laws relating to education within the province. There are also certain subjects, such as agriculture and immigration, over which both the Dominion and the Provincial Governments have jurisdiction. In case, however, the law passed by the province does not agree with that passed by the Dominion, the latter governs. Any law passed by the Provincial Government may be disallowed by the Dominion Government within one year after the receipt of an official copy of the Act. This, however, is very seldom likely to occur, except when the Act is one that interferes with the general welfare of Canada or the Empire.

New Brunswick Provincial Government

Capital—Fredericton.

Lieutenant-Governor—The Honourable William Pugsley, P.C., K.C., D.C.L., LL.D.

EXECUTIVE COUNCIL

The Executive Council consists of seven ministers in charge of departments and two ministers without portfolio.

Following out the basic principle of self-government which characterizes the success of British rule everywhere, the Provincial Government grants to local bodies

of her residents the rights to manage their own affairs as they desire, restricted only in so far as necessary for the well-being of the province at large. Four forms of municipal government are provided for according to the progress and population of the community. Three provide for urban centres and one for rural settlements. They are graded in the following order of descending responsibility: cities, towns, villages and rural municipalities. These municipalities all receive their incorporation from the Provincial Government. They elect their own officers, fix their assessment and tax rate, raise and spend money, make by-laws, and generally look to their own advancement and welfare under several provincial and federal regulations.

The Administration of Justice

The laws of New Brunswick, like all the other provinces of Canada except Quebec, are founded upon the Common Law of England. In addition to this law all English Statute Law down to the restoration of Charles II is considered to have been adopted by the General Assembly of the province at its first session. Much of the later English Statute Law is also in force in the province because of having been re-enacted by the Provincial Legislature. Other laws have been enacted by the Dominion Parliament.

This Parliament in 1875 established the Supreme Court of Canada and later the Exchequer Court. The Supreme Court has appellate jurisdiction from all the courts of the provinces. The Governor General in Council may refer questions to this court. Its judgment is final in criminal matters. This court also has jurisdiction in cases of controversies between the provinces and the Dominion, and in certain cases between the provinces themselves.

There is an appeal from the Supreme Court in civil cases, under certain limitations, to the Privy Council in England. The Privy Council also entertains appeals direct from the provincial Appeal Courts without the intervention of the Supreme Court of Canada. The decisions of the Privy Council contain most valuable and important declarations of law as to the constitution of Canada and as to the varied powers of the Federal and Provincial Legislatures.

The law is administered within New Brunswick by various courts, all of which have jurisdiction in both civil and criminal matters. The jurisdiction of the Supreme Court of New Brunswick extends over the entire province. In 1913 the constitution of this court was changed. The court now consists of three divisions—a Court of Appeal, a Chancery Division, and a King's Bench Division. The judges of this court are seven in number.

The county courts have jurisdiction only over their respective counties, and are limited to actions in which no greater sum than \$400 is involved in matters of contract and \$200 in matters of tort. They cannot deal with matters affecting the title to land or the validity of bequests under wills. They have criminal jurisdiction in all misdemeanours and in all but the more serious felonies.

Stipendiary magistrates' courts and parish courts have more limited powers. Finally come justices of the peace, whose jurisdiction extends only to \$20 in contract and \$18 in tort.

Naturalization

Any alien desiring naturalization may apply to the Secretary of State of Canada for a certificate provided that he can comply with certain conditions; namely, he must have a residence of five years in Canada or a British possession, of which at least one must have been actually spent in Canada—all this within the last eight years before his application. Any person receiving this certificate shall be entitled to all the political and other rights, powers and privileges of a British subject, and be subject to all obligations, duties and liabilities of the same. The Secretary of State may include in the certificate the names of all the children of the applicant who are minors. The applicant who is a resident of New Brunswick should apply to the Supreme Court or the county court of the county in which he is situated. The clerk shall post up his application for a specified time and then report the application to the Secretary of State, who issues the certificate if satisfied as to the circumstances.

Banking

The Canadian banking system provides the province with the best of facilities for the transaction of business. All the banks are chartered by the Dominion Government, and instead of having numerous small banks scattered throughout the country, each of which is dependent on the prosperity of its own locality for stability and strength, under the Canadian system the banking institutions are permitted to operate from their head offices, located in the largest commercial centres, any number of branches which the management and directors consider necessary to serve the interests of the country and the bank.

There are eighteen chartered banks doing business in Canada, many of which are represented in New Brunswick, the total number of branches in the province being 119. Probably every town and village of 600 people is supplied with at least one bank.

That the Canadian banks are as strong as any in the world will be seen from the following statement, as at December 31, 1919:—

Total paid up capital.. . . .	\$ 119,199,441
Total reserves.. . . .	124,712,670
Total public deposits in Canada.. . . .	1,841,478,895
Total assets.. . . .	2,967,373,675

Note holders and depositors are secured by the large capital and reserve of each bank, and by the liability of each shareholder for double the par value of shares owned.

Currency

The decimal system of currency is in use in Canada, the unit of value being one cent, one hundred of which make a dollar. The Canadian branch of the Royal Mint, at Ottawa, produces gold, silver, and bronze coins. The gold coins are minted in five and ten-dollar pieces. The silver coins are in denominations of five, ten, twenty-five, and fifty cents, which correspond practically to the British threepenny, sixpenny, shilling, and two shilling pieces, respectively. There is only one bronze coin, the one-cent piece, about equal to a halfpenny.

The change-making notes, that is, the one, two, and five-dollar bills, are issued by the Dominion Government. Chartered banks issue bills in denominations of five dollars and multiples thereof. The following notes are in general use and have values in English currency (exchange at \$4.86=£1) as follows:—

	£	s.	d.
One dollar (\$1).. . . .	0	4	1½
Two dollars (\$2).. . . .	0	8	2½
Five dollars (\$5).. . . .	1	0	6½
Ten dollars (\$10).. . . .	2	1	1½
Twenty dollars (\$20).. . . .	4	2	2½

If the immigrant from the British Isles will keep in mind that one pound sterling is approximately of the same value as five dollars (\$5) and one shilling about the same as a quarter, or twenty-five cents, he will grasp Canadian money values quickly, although the difference of fourteen cents between the pound and five dollars must not be lost sight of.

Finance

PROVINCIAL.

The chief source of revenue is the customs tariff which is administered by the Dominion Government. Funds necessary for the carrying on of the province's affairs are secured from various sources, chief among which are subsidies from the Dominion Government and fees collected by the several departments such as stumpage, motor vehicles tax, succession duties, amusement taxes, etc.

The administration of the affairs of the province requires a considerable expenditure which is added to by interest on the public debt. This debt has been acquired by borrowings for undertakings, chiefly of a permanent nature, such as means of com-

munication and public buildings. The main items of expenditure are those under education, agriculture, administration of justice, legislative assembly and public works.

Herewith is a financial statement issued by the New Brunswick Government:—

Total funded debt (including present issue)	\$ 20,664,402
Less—sinking fund	\$1,078,173
St. John and Quebec Railway debentures	6,954,408
Net funded debt	8,032,581
Indirect liabilities, fully secured	12,631,821
Estimated value of seven million acres timber limits owned by province	1,117,000
Public buildings and farm lands owned by province	50,000,000
Annual subsidy receivable from Dominion Government	650,000
	638,000

Population, 368,760; area, 27,985 square miles.

This province does not tax income, real estate or personal property for revenue purposes.

Agricultural production in 1919 was valued at \$80,971,000, or practically four times the total debt of the province.

MUNICIPAL.

Municipalities raise their money by direct taxation. Each has its assessor whose duty it is to prepare an annual statement showing all lands within the boundaries of the municipality together with the owners' names thereof, to set a valuation on these lands and on the buildings and improvements thereon, and to prepare a roll of the adult population of the municipality showing the value of the personal property and the amount of income of each. A tax is then levied to meet the estimated requirements of the ensuing year. These taxes are for roads and bridges, for schools, for general administrative purposes, for the establishment of water and sewage systems and for the acquisition and operation of public utilities.

Education

Under the provisions of the British North America Act the legislature of each province in Canada exercises exclusive control of education within its own boundaries. In New Brunswick it is under the charge of the Board of Education, composed of the Lieutenant-Governor, the members of the Executive Council, the Chancellor of the Provincial University and the Chief Superintendent of Education. The latter official has the supervision of the entire system, being ex-officio the president of the University Senate, as well as superintendent of all public schools of lower grades.

The educational system of the province, inaugurated in 1871, is most thorough and comprehensive. It is headed by the Provincial University at Fredericton, and from this distinguished seat of learning to the most humble rural public school, provisions for the dissemination of knowledge are most complete. The courses of study in the various grades, through primary, intermediate, superior and grammar schools and the university, are carefully co-ordinated and correlated, so that a child may proceed step by step until he or she graduates in either arts or science.

The New Brunswick school section must be at least three and a half square miles in area or have at least fifty children of school age. In rural districts the governing body is composed of three trustees, elected by the ratepayers, and they levy the school tax. The funds for teachers' salaries are supplemented from two other sources—the county fund and the provincial grant. Special grants are given to consolidated schools, and for the conveyance of children to and from school where the children in certain large areas are too few and scattered to require more than one school. In cities and towns the Board of Trustees consists of nine or eleven members, the majority of whom are appointed by the municipal council, and the remainder by the Provincial Government. Two of the members may be women.

All the public schools of the province are non-sectarian. There are two prominent religious educational institutions—Mount Allison University (Methodist) at Sackville, and St. Joseph's College (Roman Catholic) at Memramcook. In all schools conducted under the school law no dogmatic religious teaching is allowed, but as most of the Roman Catholic children are grouped together in the same schools under teachers of their own faith, they are thus enabled to receive religious instruction either before or after school hours.

Manual training and household science departments are operated by the School Boards in most of the cities and towns and are generously assisted by the Provincial Government. Vocational training of less than college grade for persons over fourteen years of age is also provided.

A high standard in the teaching staff is maintained through the training of teachers in the Normal and Model schools at Fredericton, through school inspection and through adequate provision for the payment and pensioning of teachers. The province is divided into eight inspectorial districts, each with one inspector whose duty is to inspect all schools in his district, make monthly reports of visitations to the Education Department and generally to assist in promoting educational efficiency.

The Provincial University was founded and incorporated as the College of New Brunswick in 1800. In 1859 the University of New Brunswick was established as now constituted. It confers the degrees of bachelor and master of arts; bachelor, master, and doctor of science; doctor of philosophy; bachelor and doctor of civil law, and the honorary degree of doctor of laws.

Agricultural education is provided in the common schools, in two special agricultural schools, one at Woodstock and one at Sussex, by the demonstrational and instructional work of district representatives, and through agricultural societies and school fairs. The Provincial Government is assisted in this work by an annual grant of \$64,110.80 from the Dominion as provided by the "Agricultural Instruction Act." The money is equitably distributed to assist all phases of instruction in the principles and practice of good farming. This subject is further dealt with in the section devoted to agriculture.

Soldiers' Civil Re-establishment

Returned soldiers in New Brunswick in need of hospital care or who, by reason of disabilities, are in need of training for vocations other than those in which they were engaged prior to enlistment, are cared for by the Department of Soldiers' Civil Re-establishment of the Dominion Government.

In Fredericton the old Government House has been enlarged to accommodate 120 hospital patients, and to furnish rooms for the administrative staff, and the vocational classes. This hospital is equipped with electro-and hydro-therapy and operating rooms, a gymnasium for muscular function work, diet kitchens, etc. In St. John a hospital of 65 beds' capacity is in operation, besides a wing of the East St. John county hospital for advanced tubercular cases. A sanatorium for tubercular patients is maintained at River Glade.

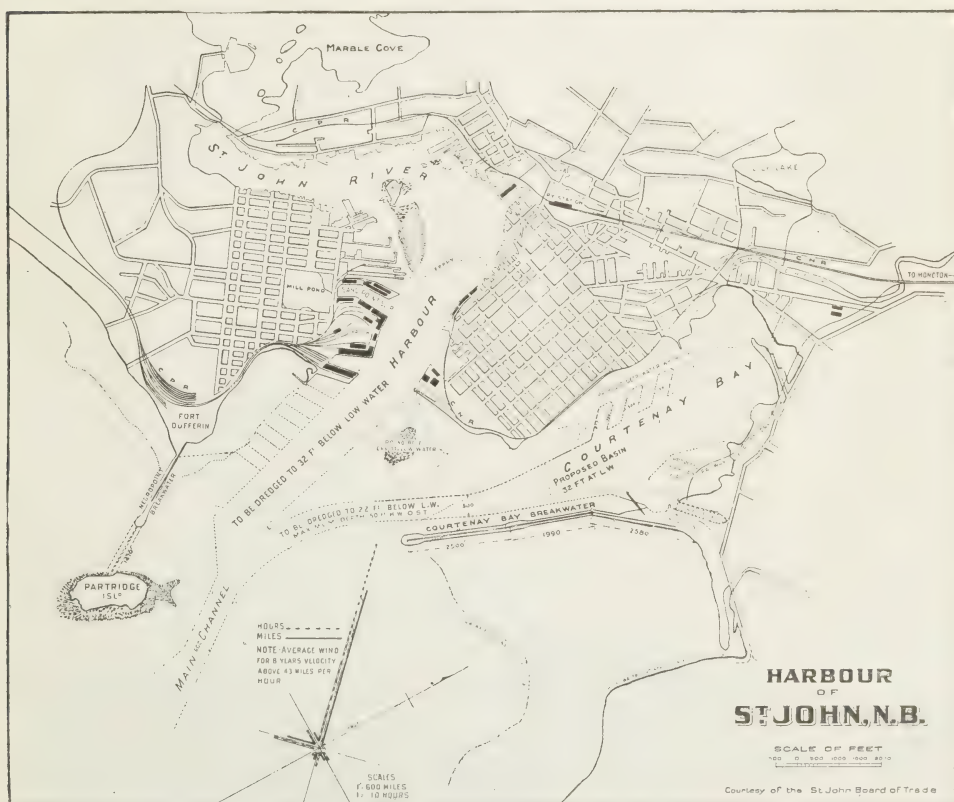
Vocational training is carried on in Fredericton, where classes in general education, motor mechanics, carpentry, electric wiring, electrical engineering, lumber scaling, gardening, shoe repairing, and stationary engineering are conducted. Up to June 30, 1920, approximately 2,000 cases for re-training passed through this branch, of whom over seventy per cent have completed their courses and have obtained employment as trained men. Unemployed numbered fifteen only. In addition a number of men have been apprenticed in different industrial institutions in the province. Most of these were given employment where apprenticed on completion of their courses.

Returned soldiers who may consider themselves eligible for assistance along these lines may apply to Lt.-Col. S. S. Wetmore, Assistant Director "K" Unit, Department of Soldiers' Civil Re-establishment, Fredericton, N.B.

CITIES AND TOWNS (Manufactures)

The geographical position of New Brunswick, and the exploitation of her natural resources, have brought into being numerous urban centres and are responsible for the growth and prominence of her cities. The long coast line, and the proximity of the province to one of the greatest fishing areas of the world, have caused fishing villages and towns manufacturing fish products to spring up along the coast. The lumbering industry is responsible for several urban centres of importance as is also agriculture. Cheap light, heat, and power in the form of natural gas has made an important industrial city of Moncton, and finally its great facilities as a national port has made St. John one of the most important cities in the Dominion.

Brief descriptions of the more important cities and towns are given below. Those desirous of obtaining more complete information regarding business, professional or other opportunities in any of the towns or cities of New Brunswick should communicate with the secretary of the local Board of Trade or with the city clerk, town clerk, or village secretary-treasurer, as the case may be.



Plan of St. John Harbour.

The site upon which *St. John* stands and its geographical position are such that this city could not but be important, and its progressive people, alive to the great opportunities of their city and port, are ensuring that St. John, which already has a volume of trade second, in Canada, only to that of Montreal, and a population of 63,000,

will shortly become one of the great ports and cities of the world. It has been aptly described as "one of the big front doors of Canada on the Atlantic coast—a door that is never closed winter or summer." In fact it is as a national winter port that its importance is most pronounced.

St. John is situated on the bay of Fundy, at the mouth of the St. John river. This great river is 450 miles long, and passes through a most fertile and beautiful region. The various products of the major part of the province find their way to the sea at St. John, where also the Canadian Pacific and Canadian National railways join forces with ocean steamships from all parts of the world.

This city is an important manufacturing, wholesale, and retail centre. Among its industries are lumber, woodworking and pulp mills; box factories; cotton mills; wool and hide plants; a sugar refinery; fish product plants; metal foundries; lime-kilns; paper-bag works; edge-tool plants; tanneries; potteries; breweries; flour mills; and factories for manufacturing nails, biscuits, confectionery, and brooms and brushes.

St. John is the financial and commercial metropolis of the province, and its development in this respect has been remarkable, especially within recent years. It has eighteen branches of chartered banks and numerous other financial institutions. Its financial progress and that of the province are indicated by the following table:—

ST. JOHN BANK CLEARINGS.

1900.....	\$ 36,925,498
1913.....	82,447,747
1914.....	78,259,921
1915.....	77,018,854
1916.....	90,582,130
1917.....	102,602,383
1918.....	116,588,787
1919.....	149,883,103

But it is chiefly to overseas trade that St. John owes its great importance, and in this trade which will come through the development of Canada generally, she lays her hopes for the future. The closing by ice of the ports of Montreal and Quebec for



St. John Harbour.

about five months each year leaves St. John as the Atlantic port nearest to Central Canada. For this reason it has been selected as the eastern terminus of the Canadian Pacific railway and as its winter port. It is also the terminus in New Brunswick of the Canadian National railways. St. John is the great railway focus of the province.

The harbour of St. John is a magnificent body of water stretching seaward as far as the eye can see. Although it has great natural advantages, being never affected by ice, and protected from storms from most directions, yet it has been very greatly improved. The main harbour on its west side possesses ten berths, with a sufficient depth of water for modern ocean-going steamers—32 feet at low tide and 58 feet at normal high tide. Six of these berths have conveyor connections with the grain elevators of the Canadian Pacific Railway. These elevators, of which there are two, have a total grain capacity of 1,750,000 bushels. Another grain conveyor connecting with one of the Government piers, is at present under course of construction. On the eastern side of the main harbour, adjoining the half-million bushel elevator of the Canadian National railways, are three berths, while at the "Long Wharf" of this railway system, situated in the northern part of the harbour, are two berths. Still another berth is that at the Atlantic Sugar Refinery, situated near the south of the harbour. This latter berth is connected with the Canadian National railways, as is the greater part of the eastern front of the main harbour.

Just outside the main harbour to the east lies Courtenay bay, which is being transformed to offer great additional facilities. At this point a large dry dock, 1,150 feet in length, is in course of construction, and when completed will be one of the largest in the world. Adjacent to this dry dock is a breakwater 7,070 feet long which is not as yet quite completed. There are also under way the construction of a ship repair yard and the dredging of a basin to accommodate shipping, and additional wharfage spaces for the Canadian National railways system. Had it not been for the suspension of this work on account of the war, it would have been completed some time ago. Courtenay bay is the second horseshoe that will bring good fortune to St. John.

Moncton is the second largest city in New Brunswick and is rapidly growing in importance. Its population is estimated to be 18,000 and with its suburbs nearly 25,000. One of its outstanding features is its importance as a railway centre, it being the converging point for several lines. It also contains the workshops and offices of the Canadian National railways, some 3,000 persons being employed in these two branches of the service. Being a railway centre it is naturally an important manufacturing and distributing point as well. An important Toronto company has recently erected a large six-story warehouse here for handling its business in the Maritime Provinces.

Still another factor contributing to the development of Moncton is natural gas. This important natural resource is dealt with under the chapter on minerals and mining. The gas is piped to Moncton from the wells and supplies factories, business houses and homes with cheap power, light, and fuel, being the only city in Eastern Canada in this position.

Among the industries of Moncton, in addition to its railway shops, are foundries, machine shops, woollen mills, cotton mills, a carriage factory, hat and cap factory, biscuit factory, marble works, wire-fencing plant, grist mill, wood-working plants and mattress factory.

Moncton is also a decidedly attractive residential city. Its scenic attractions are notable and include the famous tidal "bore" on the Petitcodiac. The wonderful wave-sculptured rocks of Hopewell are within a convenient distance.

The capital of New Brunswick is very pleasantly situated near the head of navigation on the St. John river. As early as 1692 this site was the seat of government of Acadia. Over a hundred years later it was again chosen as the location of the capital, this time of the province of New Brunswick, and was named *Fredericton*.

Fredericton is a city of about 8,000 population. Here are the Parliament buildings, the university of New Brunswick and the Provincial Normal School. The

city is also noted for the beauty of its cathedral. Its public buildings, its elm-shaded streets and comfortable homes, and the beautiful river on which it is situated, all combine to make the capital of New Brunswick a very attractive place in which to live.

The city also has some industries of importance. These include a canoe and motor-boat factory, boot and shoe works, lumber mills, tanneries, farm implement works, etc.

Fredericton is also an excellent starting point for tourists and sportsmen, who may here procure guides and equipment and need not proceed far in any direction before reaching the haunts of big game, and streams for canoeing and fishing.

Sackville is a growing town near the Nova Scotia border in the famous agricultural district of the Tantramar marshes. It has a population of about 4,000 and is becoming noted as an active industrial centre. Here are made stoves, ranges and furnaces, boots, harness, paper boxes, concrete blocks and building stone. This town is the seat of the Methodist university of Mt. Allison.

Other towns worthy of note are *Chatham* and *Newcastle* on the Miramichi, *Campbellton* and *Bathurst* on Chaleur bay, *St. Stephen* at the head of tidewater on the St. Croix and *St. Andrews* at its mouth, and the farming centres of *Woodstock* on the St. John and *Sussex* in Kings county. The first four towns owe their importance to the forests whose products reach them chiefly by the rivers at whose mouths they are situated. These towns ship their products, lumber and paper, direct to their destinations in Europe and elsewhere. St. Stephen is an industrial town also but its products are varied and include soap, confectionery, chemicals, edge tools, bricks, fertilizers, carriages and aerated waters. St. Andrews is a popular summer resort and has a deep harbour open all the year round.

Following is a list of the cities, towns, and villages in New Brunswick, with populations:

City or town.	Census, 1911.	Estimated, 1919.
St. John.. . . .	42,511	63,000
Moncton.. . . .	11,345	18,000
Fredericton.. . . .	7,208	8,000
Chatham.. . . .	4,666	5,500
Woodstock.. . . .	3,856	4,000
Campbellton.. . . .	3,817	4,500
Newcastle.. . . .	2,945	3,000
St. Stephen.. . . .	2,336	3,600
Sackville.. . . .	2,039	4,000
Sussex.. . . .	1,906	3,000
Marysville.. . . .	1,837	2,050
Edmundston.. . . .	1,821	2,600
Milltown.. . . .	1,804	2,250
Dalhousie.. . . .	1,650	1,700
Shediac.. . . .	1,442	1,500
Grand Falls.. . . .	1,280	1,750
Dorchester.. . . .	1,080	1,000
Bathurst.. . . .	960	3,500

The development and preparation of natural resources within its boundaries is improving the general conditions of New Brunswick's cities and towns. Forest products are now more and more being used as raw materials for factories within the province. The present program for utilizing water-powers will provide for many additional industries. The shipping facilities particularly those of the great port of St. John, are bringing to the province tropical and other products which may advantageously be worked up here. Thus sugar refining and cotton spinning are already New Brunswick industries of note. The development of fruit-growing and sheep-raising should give rise to greatly increased preserving, packing and wool-spinning industries. The canning of fish is also subject to great development.

The outstanding call, of course, is for tillers of the soil. But with increase in land settlement will come improved opportunities for the merchant, manufacturer and professional man.

TRANSPORTATION AND COMMUNICATION

Internal

WATERWAYS.

From earliest times the territory now called New Brunswick has had relatively excellent communication, as is also true to-day. When Champlain discovered the St. John river in 1604 he found from the Indians that this river and its tributaries formed the greater part of a water highway for canoes, extending, with few portages, right to the St. Lawrence near Tadoussac. During the early days of settlement and strife in Eastern North America this route was in constant use by canoes in summer and snowshoes in winter.

To-day this river is hardly less important as a means of communication. During the season of navigation there is a regular steamboat service between St. John and Fredericton, a distance of eighty-four miles. Some 125,000,000 feet of lumber are floated down the river as logs in the course of a year to feed the sawmills and pulp and paper plants at points along the stream.

In like manner the other rivers of the province were utilized in early days as the only means of travel and transport within the province and settlement took place along their banks. Indeed it is chiefly confined to them to this day. Also they perform a great service in bringing down to places where they can be worked up the forest products of the country. The rivers of the province are so well distributed that they have been and are of the greatest assistance to the lumbering industry.

ROADS AND BRIDGES.

For a long time the waterways were the only highways of the province but now the settled districts are well supplied with roads. The importance of good roads for the development of a country and the convenience and prosperity of its inhabitants, is fully appreciated in New Brunswick and every effort is being made to improve and maintain the highways of the province. The fast increasing general use of the automobile has served to intensify this movement and perhaps is largely responsible for the Highway Law, which came into force in 1918.

Under this Act, all the roads of the province are divided into trunk roads and branch roads, the latter being divided into several divisions. The general superintendence of all the highways, including their construction, maintenance and repair, is in the hands of the provincial road engineer. This official has direct charge of the trunk roads but the branch roads are placed under divisional supervisors, who are appointed annually by the ratepayers of the respective divisions in which they act. Taxation and motor vehicle license fees provide the necessary funds for this work.

There are 1,519 miles of main trunk roads, 1,618 miles of secondary trunk roads, and 10,500 miles of ordinary by-roads under the care of the provincial road engineers. In addition there are, in some places, winter roads which may be laid out by the road supervisor at any place and over any private property that occasion may demand, subject, in case of owner's objection, to payment of damages. Such roads may only be used by the public between December 1 and the following April 1 for the period of two years from the payment of the damages.

Intimately related to the highways are the bridges which span the innumerable streams found in all parts of the province. Over 5,000 bridges are in use, and vary in length from more than a mile to a few feet. A large number of these are handsome structures of steel with granite foundations, and many of them are provided with swing draws of the cantilever type which open and close to permit of vessels passing through.

The most notable examples of these steel bridges are to be found over the St. John river at the Reversing falls, at Fredericton, and again at Woodstock, Florenceville, and other places farther up the same river; at Newcastle, over the Miramichi; at Moncton, over the Petitecodiac, and many other places. The bridge over the St. Croix at St. Stephen, being partly in the province of New Brunswick and partly in the state of Maine, is under the care of the Dominion Government, as is the interprovincial bridge over the Matapedia between the provinces of New Brunswick and Quebec. Other bridges, known as "ordinary bridges" are substantially built of wood, and several of these are of considerable length. The total length of the wooden bridges alone, if put end to end, is upwards of 30 miles; while the steel bridges, of which there are more than 100, vary in length from 250 yards to over half a mile.

These bridges are all under the care of structural superintendents, whose duty it is to see that they are kept in proper repair, and to report the need for any repairs to the Department of Public Works. No person may ride or drive a team over a bridge at a pace faster than a walk, under a penalty of \$20. No motor vehicle may be driven over any of the public roads of the province until the owner has obtained a license therefor from the Department of Public Works. The amount to be paid for the license is based upon the weight of the vehicle, the rate being 60 cents per hundred-weight.

The annual expenditure for roads and bridges by the Provincial Government, not including the cost of permanent steel bridges, which is borne by capital account, is in round figures about \$400,000, and the municipal contributions in cash and statute labour are about a third of this sum. The province has expended upon the erection of permanent steel bridges in the last thirty years over \$4,500,000.

FERRIES.

Notwithstanding the existence of all these roads and bridges, it is still necessary in some parts to make use of the rivers and the sea as highways of communication between certain places. Subsidies and other expenses to the amount of some \$30,000 are annually provided to help maintain ferries in different parts of the province, which in some cases provide the only means of access from the outlying districts.

The most notable services are on the St. John, Kennebecasis, and St. Croix rivers, on Grand and Washdemoak lakes, Chaleur bay, and by sea between points on the coast.

RAILWAYS.

Of the five eastern provinces of Canada none are better provided with railway facilities than is New Brunswick, for there are more miles of railway in the province per head of population than is the case in any other province east of Manitoba. That they are well distributed and so located as to serve adequately provincial and national needs, is evident from a glance at the map.

There are two railway systems in the province, the Canadian National or state-owned line, and the Canadian Pacific. Many portions of both were formerly independent systems and are still sometimes referred to by their old names. The Canadian Pacific is concentrated in the western counties while the Canadian National serves the remainder of the province as well.

The Canadian Pacific railway, which has its eastern terminus at St. John, passes through nine counties in New Brunswick and extends across the continent to Vancouver in British Columbia. It has acquired or leased all of the lines in western New Brunswick, including the old St. John and Maine railway with its branch to Fredericton; the New Brunswick and Canada railway from St. Andrews to Woodstock with its branches to St. Stephen; the New Brunswick railway, from Fredericton to Woodstock on the east side of the river, and from Woodstock north to Edmundston; and the Tobique Valley railway. In the winter season this system carries immense quantities of European freight. The towns served by it, in addition to the cities of St.

John and Fredericton, include St. Andrews, St. Stephen, Woodstock, Hartland, McAdam, St. George, Andover, Grand Falls and Edmundston. The total length of this railway in New Brunswick is 614.6 miles.

The Canadian National system is composed of the Intercolonial railway, the National Transcontinental, the St. John Valley, and numerous smaller railways. The Intercolonial enters the province from Nova Scotia at the Missaguash and travels around the northeastern side of the province to the boundary of Quebec at Restigouche. At Moncton are to be found the eastern headquarters of the system, with the general offices and shops, which cover many acres of ground. From Moncton one branch runs to St. John and others to and from various points, including what was the International railway, and which runs from Campbellton to St. Leonard, in Madawaska county.

The New Brunswick portion of the National Transcontinental railway runs through the centre of the province from the northeast corner of Madawaska county to Moncton, a distance of 244 miles. This is a splendid piece of railway engineering; it is practically level from one end to the other, no grade exceeding 2.5 of one per cent. The roadbed is of the most solid construction, bridges and culverts are all of steel and granite, and it is ironed with 80-pound rails. This line was recently completed, and as it passes through forested country there are many opportunities for the development of the natural resources along its course.

Among the first settled and the most fertile districts of the province, the St. John river valley stands pre-eminent. But it has not had a railway throughout its course until very recently. The St. John Valley railway has given generous assistance and finally taken over by the New Brunswick Government. It was completed and in operation in 1919 from Westfield, on the Canadian Pacific railway, 14 miles from St. John city, to Centreville, 88 miles above Fredericton. It is sure to prove a direct stimulus to production in this fertile region, particularly of fruits and other goods of a perishable nature where rapid transference to markets is essential.

Another important feature of this line is that it provides the Canadian National with a shorter route to St. John. The National Transcontinental line crosses the Intercolonial at McGivney Junction, 34 miles from Fredericton, and traffic coming over the Transcontinental, instead of having to go to Halifax, a distance of 284 miles, to reach tidewater, can be diverted to Fredericton and thence down the Valley line to St. John, a total distance of about 100 miles. With this idea in view, the line from Fredericton to Westfield has been constructed to the National Transcontinental standard, whereas that from Fredericton north to Centreville was built to the slightly lower standard of the Intercolonial.

COMMUNICATION.

The telephone and telegraph facilities in New Brunswick are in keeping with the general advancement of its utilities. The telephone penetrates even to the remote rural districts and affords a tie which links communities together and provides a convenience everywhere that nowadays amounts almost to a necessity. The telegraph situation is represented by the railways, the steel being followed by the wires everywhere and each railway station being either a telegraph office, or, in the case of the smaller stations, connected by telephone to the nearest operating point.

The postal service is administered by the Federal Government and is maintained in a state of high efficiency. The number of post offices in New Brunswick in 1920 is 1,158. The cities of St. John, Moncton and Fredericton have postal deliveries and collections. Many rural routes have been established and mail is delivered at the farmer's gateway throughout most of the settled part of the province. This service is recognized to be of primary importance and is being extended as rapidly as possible. The only cost to the farmer is the price of the mail box.

External

The internal transportation facilities of New Brunswick, and its geographical position, are responsible for the importance of its foreign trade. St. John is the nearest ice-free port on the Atlantic to Montreal and the heart of Canada. This consideration has made St. John the eastern terminus of the Canadian Pacific railway and has made it the second port in Canada in point of volume of trade. Particulars of the city and harbour were given in the previous chapter on cities and towns.



Loading spruce deals for Great Britain, Bathurst.

Some conception of the importance of St. John in connection with ocean-borne traffi may be gathered from the fact that during the winter, lines of steamers are regularly plying between its port and such distant ports of the world as Liverpool, London, Manchester, Bristol, Dublin, Glasgow, Havre, St. Nazaire, Bordeaux, Antwerp, Christiania, South Africa, New Zealand, Australia, British West Indies, Cuba, British Guiana, Argentina, and ports on the Mediterranean. Ocean distances to important ports of the world are given in the following table:—

OCEAN DISTANCES.	
St. John to—	Nautical miles.
Belfast.....	2,588
Glasgow.....	2,660
Liverpool.....	2,747
London.....	2,967
Havre.....	2,830
Bordeaux.....	2,836
Antwerp.....	3,020
Panama Canal.....	2,350
Havana.....	1,650
New York.....	560
Boston.....	287
Halifax.....	262

An indication of the growth in trade of this port is given in the three following tables:—

VALUE OF GENERAL EXPORTS AND IMPORTS.

	Exports.	Imports.
1909..	\$ 20,668,517	\$ 6,352,659
1910..	24,988,519	7,394,175
1911..	21,659,514	7,749,848
1912..	21,895,963	8,590,197
1913..	25,594,721	9,873,026
1914..	21,359,760	9,433,220
1915..	43,872,932	9,112,916
1916..	120,042,590	11,165,463
1917..	190,586,561	15,500,659
1918..	200,783,647	16,787,200
1919..	149,986,167	15,702,446

VESSELS ENTERED AND CLEARED.

	Entered.	Registered Tonnage.	Cleared.	Registered Tonnage.
1913..	2,269	1,381,502	2,327	1,696,857
1914..	2,158	1,665,810	2,186	1,584,573
1915..	3,178	1,587,493	3,151	1,669,341
1916..	3-118	1,790,948	2,956	1,851,475
1917..	2,945	1,769,823	2,922	1,741,403
1918..	2,778	1,473,071	2,748	2,343,403
1919..	2,130	1,239,280	2,090	1,204,011

GRAIN EXPORTS FROM ST. JOHN

	Bushels.	Value.
1913-14..	7,619,346	\$ 7,542,877
1914-15..	8,612,703	8,738,780
1915-16..	14,186,522	11,405,186
1916-17..	15,999,186	16,218,169
1917-18..	14,288,898	25,579,760
1918-19..	16,295,373	33,014,536

The fact that Canada as a northern nation needs to import the distinctive products of the tropics which in turn need many of the commodities that Canada can supply, gives added importance to the national port of St. John in view of its convenience for trade with the British West Indies. An increase in the interchange of products between these portions of the Empire is considered to be of such great benefit to all that an agreement between Canada and these colonies has recently been made whereby mutual preferences of considerable extent are given, and arrangements made for greatly improved steamship and cable services. The advantages to St. John of this agreement will undoubtedly be great, both in trade and in increased manufacture in the city of tropical raw materials.

Although St. John is by far the most important port of New Brunswick, yet there are several other harbours, which though not so good nor so fortunately situated as St. John, are yet of considerable importance to the province. The ports of Campbellton, Bathurst, Chatham, and Newcastle provide the forest and other products of the province easy access to the world's markets, being frequently shipped direct to Europe and other distant points. Logs floated down the rivers to these towns and there made up into finished products are shipped direct to their destination, thus avoiding altogether the expense of railway transportation. New Brunswick also carries most of the traffic of Prince Edward Island, which crosses by car ferry from Cape Tormentine.

It will thus be seen that this province has a most fortunate geographic position, and a possession beyond value in a great ice-free port with a short rail-haul to Central Canada. This condition gives producers here an important advantage over those farther west in low transportation charges. The possession of a national winter port ensures the development of a great city with all the diverse business and manufacturing activities which are associated with and flourish on national trade routes. Moreover the existence of excellent shipping services affords easy and economical despatch of the province's own produce. New Brunswick's trade and general prosperity must share in the development of the country at large.

Part II—NATURAL RESOURCES

AGRICULTURE*

General Situation

New Brunswick's greatest natural resource is land suitable for agriculture. Of the total land area of the province, 17,910,400 acres, some ten million acres are estimated to be suitable for farm purposes. Yet, according to the census of 1911, only 4,530,298 acres were occupied as farm lands of which only 1,447,254 acres were improved, i.e., brought under cultivation, cropped, and fitted for producing crops. So it is obvious that there is great room for agricultural development. In 1911 there were 38,210 farms, of which 94.5 per cent were occupied by their owners. Approximately 22 per cent of these farms were from ten to fifty acres in extent, 33 per cent from fifty to one hundred acres, 25 per cent from one hundred to two hundred acres, and 12 per cent over two hundred acres. The remaining 8 per cent were of less than ten acres each.

In the past the tide of immigration flowed by the Maritime Provinces on its way to the great plains of the West. But the high price of land there and the lack of forest, mountain and stream with all that they mean to the home life of a people, together with high transportation charges on requirements and products of points in the interior of the continent have of late directed attention to New Brunswick, a province with an abundance of cheap, fertile agricultural land, with beautiful woods, streams, valleys and upland slopes, and a most advantageous geographical position entailing unexcelled transportation facilities and short hauls to markets and tidewater. Already people are coming back from the West to make their homes in New Brunswick and capital is being applied to its agricultural and industrial development. The province is enjoying increased prosperity and progress and its farming opportunities offer a healthy, independent and profitable livelihood to prospective settlers.

To men of moderate capital with a preference for mixed farming or with fruit-growing or sheep or poultry-raising as a specialty, New Brunswick offers distinct advantages. Owing to the fact that this province has not been exploited as an intensive or specialized farming country, it is able to offer many excellent farm properties, many of which are well adapted to a combination of general mixed and specialized farming, at prices ranging from \$15 to \$50 per acre, according to the location, quality, buildings and other such conditions.

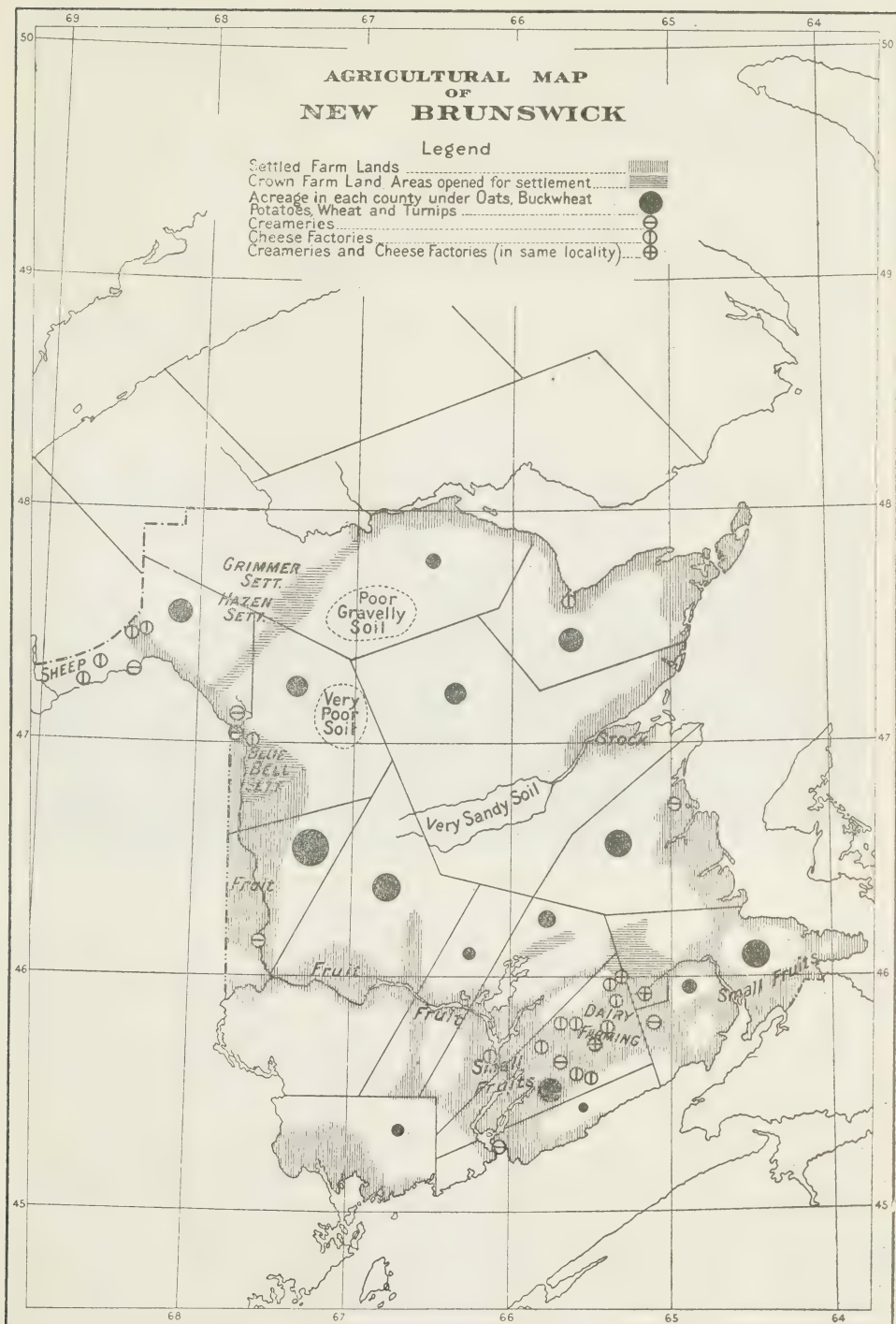
Farm Lands and Soils

The soil of New Brunswick suitable for agricultural purposes, may be roughly divided into three classes—upland, marsh land, and intervale.

The uplands, which comprise the great bulk of the farming lands of the province, are of different qualities, varying from rich alluvial loam, capable of producing large crops of hay, cereals and roots, to the very light sandy soils not sufficiently profitable for cultivation and suitable only for pasturing sheep. The character of these lands is very generally understood and the term "upland" is applied to them in this province as distinct from the intervale and marsh lands. These latter types of land, while comprising only a relatively small proportion of the total farming lands of the province, are not generally understood and hence a description of them at this time is not out of place.

The practically inexhaustible "marsh lands" which are found all along the bay of Fundy, eastward from St. John, form one of the most valuable farming assets of

* Most of this section was furnished by the Department of Agriculture, Fredericton, N.B.



Agricultural map of New Brunswick.

the province. In appearance they resemble flat stretches of prairie meadow covered with rich grass and are not at all to be confused with bogs or swamps. These marsh lands have been created by the extraordinary tides of the bay of Fundy, which sometimes race in to a height of fifty feet above low water, the current scouring out of its channel large quantities of soil and depositing the same on the land every tide in layers of varying thickness.

The land which used to be overflowed by the tide was reclaimed by dikes built by the early French settlers, and now forms a vast natural meadow with a soil sometimes 80 feet deep. It yields heavy crops of hay year after year without any fertilizing and this inexhaustible supply of cheap hay from the marsh is of great advantage to the stock farmers. If at any time the land needs reviving, the dike gates are opened for a while so that the tide can come in and deposit a fresh layer of soil. These lands are wonderfully fertile, and in this respect they are unsurpassed, if they are equalled, by any land in Eastern Canada. They are not, however, equally good for all crops, but are best for grasses and grains, to which consequently they are almost entirely given up. Root crops will grow upon them, but not to advantage. The grasses which grow upon the best parts are the usual upland English hay grasses, which grow very tall, very dense, and of very superior quality, luxuriant but not rank, producing easily



A clover field at Florenceville, St. John river valley.

three tons and upwards of the best hay to the acre. No attempt is made to take two crops a year, though some farmers allow their cattle to fatten on the rich aftergrowth. No fertilizers of any sort are placed upon the marshes, and the only cultivation consists in an occasional ploughing, on an average once in ten or fifteen years, when a single crop of oats is sown, after which the land is at once brought into grass again.

There are upwards of forty thousand acres of these dikes and reclaimed marsh lands along the bay of Fundy, east of St. John, most of which are in the counties of Albert and Westmorland.

The "intervale lands" of the river valleys were described by Professor Sheldon, who investigated the agricultural capacities of New Brunswick, as follows: "In some sections of the province there are soils which have certain very remarkable properties and features. These intervale lands, as they are aptly termed, of the St. John, Miramichi and other river valleys, are among the most valuable to be found in the Dominion of Canada, and they are generally attractive in appearance, sometimes forming beautiful and extensive islands in mid-stream, but generally flanking the river on either side. They are annually covered, more or less, and for a longer or shorter time, by the spring freshets of the rivers by which they have been formed, and are so often enriched by the alluvial deposits of mineral and vegetable matter which is left by the

subsiding waters. Generally speaking, these intervalles are clothed by a thick sward of rich and varied grasses, forming herbage unsurpassed, in all probability, by the natural grasses of any portion of the American continent, and equally valuable for pasturage or for meadow.

"To the upland farms adjoining, many of which have a frontage on the river, these intervalle lands are of great value. Cutting year by year large crops of hay whose quality is good, and requiring no assistance beyond that which the freshets furnish, they provide a large supply of forage for the winter use, and valuable aftermath for pasturage in the autumn. Thus it is that the river helps to maintain the fertility of the uplands—by covering the lowlands with a sediment which does away with the need of employing other fertilizers, so that the whole of the barnyard manure may be used on the uplands."

The land not yet brought under cultivation, of which the province holds some 7,000,000 acres, is mostly timbered and a considerable proportion is not suitable for agriculture, but there are extensive areas which on clearing would make excellent farming land. These Crown lands can be obtained by settlers as free grants of 100 acres by residing on the land for eight years, clearing ten acres and building a house 16 by 20 feet.

No land is thrown open for settlement, however, unless it is well served by roads and is adapted for agriculture. One of the important features of the forest survey that is now under way is the classification and marking out of the agricultural lands, the object being to direct future settlement to suitable farming localities and to prevent the denuding of purely timber land under the guise of clearing for agricultural purposes.

Of the uncleared portions of the province the best soils are in the north and west, and here, in the counties of Victoria and Restigouche, are the principal areas that have been made available for settlement, although districts containing good land have been opened in Westmorland and Queens also. Of these new districts the Blue Bell tract is perhaps most worthy of attention. It comprises some 50,000 acres in Victoria county, and is bounded by the Canadian Pacific railway, the St. John river and the Canadian National railway. It is a rolling upland, covered with a fine growth of trees, free from underbrush and easily cleared. The soil is a reddish loam with clay subsoil, and is well watered by branches of the Tobique river. Nearby are the towns of Grand Falls and Plaster Rock. In this area 7,000 acres have already been thrown open for settlement and 100-acre lots are available on each side of the colonization road which has been constructed.

Classes of Farm Lands Available

Farms in various stages of improvement may be purchased throughout the settled portions of New Brunswick as well as the above-mentioned Crown Lands. They may be classed as to soil area under cultivation, equipment, and general condition. They range from the very best in each class downwards, neglect from lack of help or change of ownership being often responsible for unfavourable conditions where they exist. Vacant farms, where such exist, are often well worth taking up, though in some cases they are the result of settlement attempted in the past on land not suitable for agriculture.

Improved farms available for purchase vary in size from 75 to 200 acres, with from 20 to 100 acres cleared and ready for cropping and pasturage, an abundance of firewood and in some cases a fair amount of lumber. A number of these farms have small orchards sufficient to provide all the apples and such fruit needed for family use. The buildings are generally adequate, in some cases needing repair, but in most cases ready for occupancy and worth as much or more than the entire cost of the property. While the soil on some of these places is somewhat run down from neglect, they are so cheap that the new settler can afford to buy hay and fertilizer the first year with which to sustain his live stock and produce his crops.

Why Farms Are So Readily Obtainable

The difference in density of population between Europe and America makes it difficult for Europeans to comprehend the readiness with which a Canadian will sell or leave his farm and take the chance of getting another one that will suit him better. In the older countries land is held by the same family for generations, or until it has come to be looked on almost as a part of themselves, and they rarely think of parting with it unless compelled by stress of circumstances to do so. In many instances, it is entailed from father to son and cannot be sold without an Act of Parliament. Here it is entirely different. Very few farms in Canada have been in the possession of one family more than one or two generations, and if a man is offered what he considers a good price for his farm he is quite likely to take it, since farms are plentiful and there is always the opportunity to buy another and perhaps a better one. For this reason, improved farms in good condition may be bought without much difficulty although not many are being offered for sale. From time to time such properties are advertised for sale for various reasons. In some cases the owner wishes to go West or locate in some district where he thinks the opportunities are better; or perhaps having done well on the farm and saved considerable money, he wishes to take up business in town or city. But in the case of other good farms, in good condition, the decision to sell is often brought about by the breaking up of the family resulting from conditions about as follows: In the old days farm work consisted so largely of drudgery and offered so little scope for high intellectual talent that the bright boys not only wanted to leave the farm but were encouraged by their parents to do so. The ranks of the medical, legal and teaching professions and commercial men in the cities and towns of Canada and the Eastern United States have been largely recruited from the farm boys of New Brunswick and Eastern Canada. The success which these men have achieved in every profession, while it speaks eloquently for their ancestors and for the climate in which they were brought up, was a distinct loss to our farmers. Many of the country boys were also attracted away by the glamour of the newly opened West and settled there although some of them might just as well have stayed in New Brunswick. Be that as it may, the sturdy training and hard work of their youth was certainly the best possible preparation for the new lands to which they went. The farm youths of Eastern Canada have played a noble part in building up Western Canada and making that country what it is to-day and there is no doubt that they were better suited as settlers for the West than most of the Old Country farmers whose home surroundings and up-bringing better qualified them for the older settled districts of Eastern Canada. So these two factors—the lure of the cities and the development of the West—did much to deplete the rural population of the Maritime Provinces and Ontario, and has left a number of farm homes where the old people find themselves all alone or with most of their family gone. Unable to keep the farm up to its former state of production and with nobody in the family to take it over they prefer to dispose of it to some one better able to work it, and spend the remainder of their days in retirement in a nearby town.

Other farms are to be had in fair quantity whose owners are principally interested in lumbering and other pursuits and who use the farm chiefly as a place of residence, growing vegetables and other produce on it for their own use. In these cases the farming operations are secondary to the others, but many such farms are capable of far greater production.

Under the above-noted conditions a considerable number of farms have become vacant. The best of these are being repopulated under the Farm Settlement Board and already a large proportion has been occupied again. Others are not suitable for agriculture and should never have been settled. Mistakes of this nature may be avoided by consulting the board. A list of unoccupied farms in New Brunswick may be had on application to the Superintendent, Natural Resources Intelligence Branch, Department of the Interior, Ottawa.

How Farms May Be Acquired

The means of acquiring a farm offered by the province through the *Farm Settlement Board*, should appeal to the man with limited capital only. This board has, at various times, bought available farms and will at any time purchase any other vacant farm that an applicant may desire—which it will resell to a purchaser at cost price, on the following terms: Twenty-five per cent of the purchase money, if the price being paid for the property purchased is less than one thousand dollars, but if in excess of that sum, then an initial payment of thirty-five per cent to be paid when possession is given to the purchaser, and the balance with interest at five per cent thereon, at such stated periods as the board may agree upon with the purchaser; the final payment must be made at a date not exceeding ten years from the date of the agreement to purchase, except that in special cases an extension of two years may be given by unanimous consent of the board.

The title to the lands so purchased by or granted to the board, shall remain in the board until the purchaser has made all payments required by the agreement to purchase; but nothing shall prevent the board from selling to any purchaser for cash at any time, and from forthwith conveying the lands so purchased to such purchaser for cash.

Quite a large number of farms have found new owners under the auspices of the Farm Settlement Board, as the terms under which the farms can be acquired are so liberal, that a young man can readily earn his living and be paying for his farm while paying annually only such a sum as would, in the great majority of cases, be about the amount he would have to pay for rent alone.

CROWN LANDS.

The man who is without capital, or who has only so little that he cannot afford to spend any part of it in acquiring a farm, can still obtain one of 100 acres under the provisions of the "Labour Act." Under this Act, the Lieutenant Governor in Council may cause suitable portions of the vacant Crown Lands to be selected for settlement in various parts of the province, and cause public roads to be made to and through such lands, and may have the said lands surveyed and laid off in one-hundred-acre lots on both sides of such road.

All lots so surveyed and laid off, and all other lots of Crown Land which have been surveyed and are open for settlement shall be reserved for actual settlers, and shall not be disposed of to speculators or for lumbering purposes.

They shall be available to applicants upon the following terms:—

(1) Applicant must be a male of 18 years or over and must not be the owner of any land in the province.

(2) Not more than 100 acres will be allotted to any one applicant and the land must have been approved by the Crown as suitable for farming.

(3) The Crown retains the right to all minerals in lands which are granted, but mining rights can be obtained upon application to the Government.

(4) Applicant must actually live on the lot and cultivate it during the three consecutive years succeeding his allotment, but he may absent himself during the months of July, August, January, February and March.

(5) Applicant must within three years after allotment build a habitable house not less than 16 by 20 feet and clear two acres, and he must clear and cultivate not less than ten acres before receiving his grant.

(6) During the period of occupancy and before a grant will issue, applicant must perform \$30 worth of work upon the public roads or in lieu thereof pay to the Crown \$20.

(7) No timber shall be cut upon the lot until a grant is issued, except within the ten-acre tract selected for a homestead.

In addition to the above the following special regulations apply to the Blue Bell tract:—

(1) Applicant must pay one dollar per acre, twenty-five per cent on application and the balance in three annual instalments.

(2) Applicant must in the first year of occupation clear and grub three acres, in the second year plant and crop the three acres and cut down two additional acres; before the end of the third year erect on the lot a habitable house 16 by 20 feet.

(3) After the first instalment is paid, he may cut from the lot 20,000 feet board measure of lumber free, for building purposes only, and an additional 20,000 feet upon payment of stumpage duties.

So that taking matters all around, it is not difficult for any man, let his circumstances be what they may, to obtain a farm in New Brunswick. When one compares all the various phases of the situation in this province with those to be met with in the Western Provinces, it becomes a source of wonderment why so many people have gone West. While it may be true that in the western prairies a free farm of 160 acres ready for the plough can be obtained, yet in New Brunswick one is in the midst of civilization, with neighbours, railway, school and church within a mile or so at most and in marked contrast to prairie conditions. The countryside is delightfully picturesque, well wooded and well watered. There are excellent markets for all the farmer can produce right at his very door, and any man who chooses to set to work in New Brunswick with the same amount of determination and effort as he would need to put forth in the West, will very soon find himself more than "making good."

SOLDIER SETTLEMENT BOARD.

The Soldier Settlement Act applies to honourably discharged veterans of the Canadian, Imperial or Dominions' Forces, who served out of the country of enlistment, or members of any Allied Force who were resident in Canada prior to the war, or members of the Canadian Force who are receiving pensions for injuries incurred during service in Canada.

Widows of any of the above classes of men who were ordinarily resident in Canada before the war and who served with the Canadian, Imperial or Allied Forces in a theatre of war, are extended the same privileges. Nursing sisters who were ordinarily resident in Canada before the war and who served in a theatre of war are included.

The Soldier Settlement Board may purchase for eligible returned soldiers lands in any part of Canada, if such lands are suitable for immediate settlement. The board also is empowered to purchase stock, equipment and building material for resale to soldier settlers at cost.

The applicant for the privileges of the Act is required to pass a qualification test before becoming eligible for its benefits. If he is deemed to be a person well qualified for the vocation of farming, the board will assist him to purchase a suitable farm and to equip it; and it will guide him in his operations until he has demonstrated that he can succeed. Loans are available up to a maximum of \$7,500, the interest rate being five per cent. The soldier is required to pay 10 per cent of the purchase price of his land in cash. With regard to Imperial soldiers, they are required to pay 20 per cent of the purchase price of land and also equipment. They are required to deposit £200 with the board as a guarantee that they will be able to pay the required 20 per cent and to carry on successfully until adequate returns are obtained from their farms. They are required, on passing a preliminary test in England, to spend a period of from one to two years on Canadian farms gaining experience before becoming eligible for loans.

The soldier is required to choose his own land and is responsible for that choice, but the board has its own appraisers who also inspect the land before purchase.

The board may loan up to \$4,500 on the purchase of land and \$1,000 for permanent improvements. In the case of unimproved lands the first instalment is payable not later than two years from date of sale or advance and shall consist of accrued interest only for the broken year up to the first of the following October. The interest for the second year will be consolidated with the amortized payments over a period of twenty-five years, and the first payment shall be made the first day of October in the third year.

On improved lands settlers begin repayment on loan for land purchased and permanent improvements not later than one year from date of sale.

The board also may grant loans for implements and stock up to a maximum of \$2,000, which are repayable in six equal annual instalments. In the case of the settler on unimproved lands no interest is charged for two years.

While the amounts owing the Settlement Board remain unpaid, the land and goods supplied are fully protected from seizure to the prejudice of the board, nor can sales or charges be made without the board's consent. The crops grown are protected from seizure to the extent of the obligations due the board, or to fall due within a reasonable time after seizure.

Up to July 10, 1920, returned soldiers to the number of 480 had been settled in New Brunswick, and loans had been approved to the amount of \$1,367,465.

The New Brunswick office of the Soldier Settlement Board of Canada is in the Post Office Building, St. John, where full information can be obtained from the officer in charge.

The Improvement in Markets for Farm Produce and Conditions of Farm Life

Before considering the opportunities offered in the different branches of farming, it is important to point out the vast difference in conditions surrounding farm life to-day as compared with those of a quarter of a century ago, referred to in preceding paragraphs.

The steady continent-wide flow of the people from the country to the city has made itself felt in the ratio of supply and demand, the latter having steadily increased as the former has decreased, to a large extent reversing the market situation of twenty-five years ago. Canada has made big strides industrially and very largely increased her population, consequently the Canadian home markets are far greater. In keeping with the other provinces of Eastern Canada, New Brunswick is experiencing a period of industrial and general development and prosperity with resulting large increases in local markets and food requirements, in addition to which the heavy ocean traffic from the winter port of St. John calls for large quantities of vegetables, fruits, and meat, poultry and dairy products.

The social living and working conditions have undergone remarkable changes for the better. Improved methods and machinery have done much to remove the drudgery and supply the much needed interest that hitherto was lacking. No longer is farming considered as something that any man can do but rather as a calling that demands a high degree of skill, intelligence and industry and offers scope for the most active minds. The general establishment of telephone, almost every farm being on a telephone line, and of free rural mail delivery, the improvement of roads and the common use of automobiles together with the improved railway facilities, have to a large extent removed the former isolation of country life and brought the rural people into much closer touch with each other as well as with the towns and cities or centres of population. General and agricultural education facilities as provided by the Provincial and Federal Governments have also greatly improved the position of the farmer and his family.

Women's Institutes and the Improvement of Living Conditions

Much has been said, and rightly so, concerning the improved conditions under which farming to-day is conducted in New Brunswick. The industry of farming, and the term is used advisedly, is one of the leading if not the primary industry, in this province and the opportunities afforded by the agricultural schools, Extension Services of the Provincial and Dominion Departments of Agriculture, and other organizations, have aided materially in bringing the industry into its present prominent position. But if agricultural instruction has done so much for the men, what about the women of the province? What has been done for them?

In 1911, the work of establishing Women's Institutes throughout the province was started, a Women's Institute Division being created in the Department of Agriculture through which such work could be efficiently conducted. Educating the farmer and the farmer's son and improving their conditions was not in itself sufficient, for similar opportunities for improvement and further education must be afforded the women of the farm before a true development of the whole agrarian circle could be obtained. With this object in view, women organizers, demonstrators and lecturers were sent to the rural districts to explain the objects and demonstrate the advantages to be gained by having a Women's Institute in the community. The objects were to improve the physical and ethical standards; awaken a desire for clean, well-arranged homes and healthful surroundings; raise the standard of efficiency in the management of home affairs; develop agriculture; promote educational, moral, social and economic measures; and encourage co-operation and community efforts.

At first, institutes were organized in a few communities, and these aroused interest in neighbouring localities. Thus the good work was spread until at the present time there are 134 branch institutes, representing some 5,000 women, working not only in the country but also in village, town and city. The work could not be confined to the rural districts since the problem of the homemaker, both in populous centres and in the more sparsely settled districts was similar, fundamentally. The institutes have fully realized the great scope of their work and already have achieved a great measure of success. Being a non-partisan, non-sectarian organization, an excellent opportunity is given to all sects and classes to come together upon mutual ground and to discuss matters common to all.

The first work taken up outside the home was the improvement of the schools. Sanitary conditions in and around the school buildings were investigated, and remedied wherever possible. Sanitary drinking fountains and cups were installed and in several instances a general renovation was effected. In other cases, modern equipment replaced that of many years' standing and provision was made for school gardens and fairs. Going still deeper into child welfare, medical inspection of schools was introduced into the rural districts. In general, all in child life that tends to improve the physical standard received generous consideration and support.

More recently, a deep interest in community welfares and the establishment of community centres is being developed. Institute after institute reports the remodelling or equipping of a community hall, the erection of a building for community purposes, or the formation of plans whereby a certain community becomes the proud possessor of a centre from which to radiate the beneficial results of the community spirit.

Public improvements also receive the attention of the institutes. More than one village boasts of a new sidewalk, the installation of street lights, the erection of a public drinking fountain, the provision of a bandstand, the improvement of parks and public highways, through their efforts. Nor are members of the Women's Institutes averse to co-operating with other organizations. They are always ready and willing to assist in everything that tends to develop better citizenship. To encourage these activities the Department of Agriculture, through its Women's Institutes, sends out graduates in household science during the summer months, to demonstrate and explain various lines of work such as cookery, sewing, home nursing, and house management.

During the winter short courses in household science, i.e., classes in cookery, sewing, millinery and nursing are held at different centres, thus bringing the practical benefits of scientific research and training direct to the homes of the people.

"For Home and Country" is the motto of the Women's Institutes, and they are proving themselves to be a powerful and increasing factor in the improvement of those social and living conditions upon which a nation's wellbeing and greatness is based.

The Departments of Agriculture

PROVINCIAL.

Agriculture being the basic industry of the province, it is natural that the department devoted to its interests should be one of the busiest of the provincial service. The Department of Agriculture, with headquarters at Fredericton, and branch offices at St. John, Sussex, Moncton, Chatham, and Woodstock, aims to assist and guide farmers in the improvement of their methods of production and marketing, to encourage co-operation, and to better social conditions. It is headquarters in the province for information on all matters pertaining to farming, and both old and new settlers are invited to avail themselves at all times of the information so offered and of its extensive services. By so doing many farmers are meeting with more success in their work and safeguarding themselves against prejudiced or ignorant advice from other quarters. The new settler, particularly, may benefit through keeping in close touch with the department and obtaining its advice and guidance in locating and deciding on the farm to be bought.

The department is presided over by the Minister of Agriculture, who is assisted by the deputy minister and a staff of trained officials. The work of the department is divided into various branches or divisions, each of them in charge of specially qualified experts and in this way the work of each division is clearly defined and duplication of effort is avoided. The various methods by which the department carries out its work are described in the annual agricultural reports, copies of which may be had on application to the office of the department, Fredericton.

FEDERAL.

The Dominion Department of Agriculture at Ottawa is also most active in furthering the industry in New Brunswick. An extensive experimental farm is conducted at Fredericton. All the activities of farm life are here carried on and experiments and tests are constantly being made in field and animal husbandry. The federal department embraces a number of divisions specializing on certain subjects, such as divisions of chemistry, economic botany and animal husbandry. The province enjoys the benefits of the results obtained from the work and experiments of these divisions.

Field Crops

New Brunswick agriculture is characterized by the successful production of a wide range of crops, the variety and nature of which should be sufficiently attractive, and the field for their production be large enough, for any intending settler. In looking over the following pages it should be remembered that the average yields per acre, made up as they are by the good, poor and indifferent farmers and the best and poorest sections, do not at all represent the yields that the best conditions plus the best farming practice, will produce. For example, by taking the counties showing the highest average yields per acre in 1919, we get the following yields in bushels: wheat, 21½; oats, 41½; barley, 32; buckwheat, 33; potatoes, 205; and turnips, 617. Again in 1919, yields were recorded three times as large as the averages. One farm in Kent county produced 34

tons of air-dry hay from 8 acres, and 225 bushels of wheat from 4 acres. A farm in Carleton county produced 180 barrels or 495 bushels of Cumming's Pride potatoes per acre, while in the Sackville district yields of 420 bushels of potatoes and 1,400 bushels of turnips per acre were secured.

The principal field crops are oats, buckwheat, wheat, barley, potatoes, turnips, and hay. The 1919 production of these crops was approximately as follows:—

Crop.	Acreage.	Yield.	Value.	Yield per acre.
Oats	305,484	9,260,000 bushels	\$9,086,000	30.25 bushels
Buckwheat.	74,642	1,871,000 "	2,547,000	25.00 "
Wheat.	35,641	623,000 "	1,444,000	17.5 "
Barley.	10,662	285,000 "	385,000	26.75 "
Potatoes.	60,000	10,790,000 "	16,185,300	180 "
Turnips.	12,000	5,474,000 "	2,169,600	450 "
Hay.	750,000	1,125,000 "	22,500,000	1½ tons.

Oats comprise the most extensively grown grain crop, with an average yield of about thirty bushels to the acre. Buckwheat is quite generally cultivated, much of it being used by country people for food as well as for stock-feeding. It does well on the lighter soils and gives a good yield on comparatively poor lands under our favourable climatic conditions.



Cutting oats near Chatham.

Although the soils of many parts of the province are well adapted to the growth of wheat, the cheapness with which it had been produced up to the outbreak of the war on the vast prairies of the western provinces, had an effect in deterring the farmer of New Brunswick from growing that crop; and for several years prior to 1914 its cultivation was almost abandoned in the province, but recently the Government has taken up the matter, recognizing the fact that wheat-growing, even though it may not be so immediately profitable as some other crops, is a feature of good agriculture and that the province ought not to depend on other parts of the Dominion for its bread. The war has further emphasized the need of the province being self-supporting as far

as breadstuffs are concerned and there is no doubt that interest in the cultivation of wheat is making steady progress, as the statistics above quoted show. To encourage the growth of wheat, the Government provides a handsome bonus towards the cost of construction of up-to-date roller mills in approved districts, where the wheat grown in those districts may be ground into flour, etc. A number of these modern mills are to be found in different parts of the province, and others are in course of erection.

Barley is not grown to any great extent, there being no opportunity to use it for malting purposes and farmers appear to prefer cornmeal—or did prefer it until the price of that meal got so high. As a food for fattening stock, barley is superior to cornmeal, and it may be hoped that the high price of this meal, which cannot be grown in this province, will induce farmers to produce larger crops of barley for feed. The acreage has doubled recently.

The happy combination of abundance of sunshine and plenty of moisture without periods of drought or extreme heat, which characterizes our growing seasons, are ideal for the production of roots and vegetables of the highest quality and consequently New Brunswick potatoes, turnips and garden vegetables have gained a reputation for culinary and market purposes unsurpassed on the American continent.

Turnips are being sown in increasing extent, the ease with which they can be grown causing stockraisers to depend almost entirely on turnips and hay for winter-feeding. Considerable quantities of turnips are shipped for table use to Boston and other New England markets, these coming almost entirely from Charlotte county and the St. John valley.

The potato is the most highly specialized of the field crops, the annual value of the crop being from ten to fifteen million dollars according to the seasonal variation in yield and prices. The comparatively cool, moist climate keeps the potatoes growing longer and they are green and vigorous until the frost comes, hence their firmness, full starch content, good keeping quality and pleasant flavour. Their excellence both for edible and seed purposes has gained a high reputation for them in the large consuming centres of Canada and the New England States and also in the West Indies, in which places they find a ready market. They are also increasingly in demand for seed purposes in Ontario and in such states as Massachusetts, Rhode Island, Connecticut and New Jersey, where they have been found to give much superior yields to the locally-grown tubers. The average yield per acre of about 180 bushels is second on the American continent only to that of the state of Maine. In the chief producing sections of the province, in the counties of Carleton and Victoria, crops of 100 to 130 barrels or 275 to 350 bushels per acre are commonly secured by the application of the best methods of culture. As a specialized crop on the general farm, the potato is decidedly profitable and constitutes an important, safe, and increasing part of New Brunswick agriculture. It fits in very well with apple growing, being particularly well suited for intercropping young orchards.

The same climatic conditions which are so favourable to the production of roots and vegetables are equally favourable to the growth of clover and grasses, and consequently there is an abundance of pasturage, and a large production of hay, a considerable quantity of which is baled and exported.

Additional field crops grown successfully but only to a limited extent are rye, 353 acres; peas, 4,697 acres; mixed grains, 5,297 acres; fodder corn, 5,906 acres; and beans, 6,409 acres.

The growing of red clover for seed has lately received attention, quite a number of farmers harvesting an acre or two for seed. A few growers have undertaken more extensive operations with much success and one farmer in Victoria county secured 3,500 pounds of seed from 25 acres.

Live Stock

One of the greatest needs of agriculture in New Brunswick at the present time is more live stock of all kinds. Natural conditions are distinctly favourable, inasmuch as soil and climate which produce all kinds of fodder crops of high quality in abund-

ance, provide cheap raw material for the stock raiser and dairyman. There are thousands of acres of pasture land available for feeding purposes, and many thousands of tons of hay are sold off the farm annually which might be fed to better advantage to cattle or sheep. The following table shows the amount of live stock in the province for the last five years:—

	1915	1916	1917	1918	1919
Horses... ..	65,827	65,169	65,169	66,590	77,828
Milch cattle.	101,665	100,221	100,221	120,123	153,058
Other cattle.	96,437	92,223	89,456	146,624	211,964
Sheep... ..	111,026	105,997	103,877	140,015	212,745
Swine... ..	72,533	70,683	69,269	79,814	104,939
Poultry (all kinds). . .	.....	.....	.....	675,412	796,698

During the last few years large amounts have been spent both by the province and by private individuals in importing animals of various classes from outside sources with the object of holding up the quality of the live stock of the province. Interest in pure-bred live stock was anything but keen for a few years and the quality of many herds was very much lowered which had a damaging effect on the ordinary stock and the nondescript became much too common. This indifference, however, is



Ayrshire cattle are well adapted to New Brunswick conditions.

being gradually overcome; a few enthusiastic men of the younger generation have worked wonders in this direction during the last few years, and at the present time there are to be found many herds of high-class stock of various kinds. The Department of Agriculture is doing everything in its power to encourage the improvement in live stock and to this end pays large sums annually by way of bonuses to the various agricultural societies for the purchase of pure-bred sires for the use of their members.

The principal breeds of cattle for dairy purposes are Holsteins and Ayrshires, though several herds of the Channel Island cattle are also to be found. Of the beef-producing type the Shorthorn or Durham predominates. The great majority of cattle, however, are grades of one or other of these breeds. For practical farm purposes, many of these grades are very valuable in point of production, and it is not a difficult matter by using a pure-bred sire of the predominating breed of the grade to build up in time an exceedingly useful herd of animals.

At present New Brunswick depends largely on Ontario and Western Canada for its beef supply, although the abundance of well-watered grass lands and cheap fodder should at least make it self-supporting. The production of beef is carried on to only a limited extent, as dairying is found to be more profitable and for this reason the dairy breeds predominate. Straight beef-raising could probably be made profitable

under proper management in some localities where lands could be cheaply obtained, but taking the province as a whole, it could not be compared in profit with the keeping of dual purpose or good grade Shorthorn cows, that would give from five to ten thousand pounds of milk each year and a calf that for our markets would make beef as profitably under three years old as one from a special beef cow. A modification of the two systems could be run to advantage, perhaps, by allowing two calves to one cow, and saving the trouble of hand feeding the calf and of milking half the cows. There are some farms where there is a large amount of cheap pasturage, with access to unfenced areas where cattle could be run at some profit without paying any attention to the dairy end of it.

Horses of the finest breed can be raised in the province, but as yet there is not sufficient local demand for high-class draught horses to support the right kind of sires. A few progressive horsemen continue to import high-class stallions, even under these unfavorable conditions, and now receive some support through the enforcement of the new Stallion Act, which provides that no stallion shall be permitted to travel the country until he has been enrolled in the books of the department, which cannot be done until proof of his breeding and absolute soundness have been produced.

Pigs are kept on most of the farms and are easily and cheaply raised, except that during the past three years the cost of growing them increased, largely through the high cost of millfeeds due to war conditions. However, this extra cost is covered by the great increase in the price of pork and pork products, which is now twice the pre-war figure. The majority of the stock kept is grade Yorkshire, with some grade Chester and Berkshire. An excellent market for the whole hog is assured by the large number of lumber camps, and there is a very good general demand for both bacon and salt pork.

Hogs alone can use to best advantage certain feeds and surpluses of crops, and because they multiply rapidly, are housed easily, feed economically, mature early, kill with very little waste and provide a food necessity which is consumed in enormous quantities, they therefore form an important part in mixed farming practice. Realizing this, the Department of Agriculture is encouraging the raising of swine through the establishment of Boys' Pig Clubs and by assisting and organizing the co-operative marketing of the finished product.

SHEEP-RAISING

While sheep-raising has been a more or less important industry in New Brunswick from the time of the earliest settlers, yet there has always been room for far greater numbers.

No province in Canada has a climate and natural conditions more conducive to the successful raising of sheep. Professor Brown, of the Ontario Agricultural College, made the following statement regarding the possibilities for sheep-raising in New Brunswick: "British Columbia excepted, you hold the only extensive and naturally suitable lands in the Dominion of Canada for the cheap production of wool and mutton. At a rough under-estimate there are now in New Brunswick and Nova Scotia some 2,000,000 acres of sheep runs, outside of the arable, bush, rock, water-meadow and the richer cattle grazing lands of the valleys. These should carry such a number as to produce annually—not to maintain, but to sell off each year—40,000,000 pounds of mutton and 20,000,000 pounds of wool. This is no wild speculative calculation but one based upon my own handling of the same subject in Scotland and Ontario and upon the experience of other Canadian flock masters."

However, notwithstanding these favourable natural conditions, fear of loss from the ravages of dogs, general lack of interest, and depressed market conditions caused the number of sheep in the province to decrease from 1911, until in 1917 they numbered 103,877, which represented a decrease of 100,000 in seven years. Faced by this discouraging decrease and realizing the great opportunities for sheep-raising which

the province offered, the Provincial Government and Department of Agriculture took strong measures to revive the industry and since 1917 the increase has been remarkably rapid and the number of sheep, according to estimates compiled in June, 1919, was 212,745, an increase of 103.84 per cent in less than three years. This large increase was due to the higher prices for wool, lambs and mutton, together with the active measures of Government assistance which included the enacting of protective legislation, the importation of pure-bred sheep and the establishment of co-operative marketing of wool and lambs.

One of the greatest factors in this recent improvement of the sheep industry is the work in wool grading and co-operative selling carried on under the auspices of the New Brunswick and Dominion Departments of Agriculture. It speaks well for the success of this work that the amount of wool graded each year shows a substantial increase and the number of satisfied producers also continues to grow. During 1919 a grading station was established at Fredericton and arrangements made whereby any flock owner in the province could ship his wool clip to that point. Thus, wool was graded and sold direct to the manufacturers, netting the owner a much higher price, dispensing with the old method of sale, the flat price, and placing a premium on quality, thereby stimulating better care of wool and sheep.

The growth of the co-operative wool marketing business in the province is indicated by the following table, showing the amounts of the various grades handled in each of the two years in which this plan has been followed:—

Grade.	Lbs. handled in 1918.	Lbs. handled in 1919.	Net Price to farmer 1918.	Net Price to farmer 1919.
			\$	\$
Clothing.....	50		0.81 $\frac{3}{4}$	
Fine medium combing.....	1,778		0.82 $\frac{1}{2}$	
Medium combing.....	18,602	24,550	0.81 $\frac{3}{4}$	0.67
Medium clothing.....	39		0.79	
Low medium combing.....	9,502	28,127	0.75 $\frac{1}{2}$	0.62
Low combing.....		1,092		0.49
Coarse.....	691	334	0.69 $\frac{1}{2}$	0.42
Cotts.....		230		0.26
Rejects.....	403.5	27	0.42	0.29
Grey and black.....	367.5	842	0.50	0.39
Locks and pieces.....	150		0.40	
Tags.....	152	638	0.10	0.08
Total.....	31,735.0	55,840	0.771	0.627

Average price in 1918—\$0.77.

Number of shippers in 1918—317.

Average price in 1919—\$0.627.

Number of shippers in 1919—547.

The wool market afforded the sheep raiser is equal to any in Canada. He markets this product through the Canadian Co-operative Wool Growers, Ltd. This company handles, in the interest of the farmers, 5,000,000 pounds of the Canadian wool clip. In the past, the New Brunswick wool graded higher than that from the western provinces, hence a higher price per pound was obtained. Freight rates in connection with the co-operative marketing are pooled, bringing the market equally close to the door of every sheep raiser. Prices received correspond with the highest market prices at Boston, which is the controlling market for America.

The large centres afford a ready market for lambs and mutton. St. John, the winter port of Canada, situated on the Atlantic seaboard, uses a large amount of mutton for home consumption and for provisioning the ocean-going liners. The surplus sheep are either butchered in the province and exported to Boston and New York markets or shipped alive in the fall to Montreal and Toronto. During the fall of 1919 many carloads were thus disposed of. The sheep were collected and sold co-operatively by farmers' associations and the work was supervised by the Provincial

and Federal Departments of Agriculture. Market prices, less shipping charges of approximately one cent per pound, were received by the patrons. The erection of the proposed abattoir and stock yards at a central location in the Maritime Provinces will greatly improve the present marketing facilities.

Although the present number of sheep is more than double that of three years ago, the sheep-raising possibilities of the province have barely been touched. A higher class of sheep is now being kept as a result of the premium placed on quality by the advanced methods of marketing. The sheep industry was never on a stronger footing and with the present good prices for wool, mutton and lambs and all evidence pointing to their remaining high for some years to come, the industry should make rapid advances.

DAIRYING

As long ago as 1890 an effort was made by the Government of the day to stimulate the dairy industry by the establishment of co-operative butter and cheese factories on a bonus system. At that time the hand separator was little known and the inducements offered by the factories were such as to cause a continual increase in the number of patrons and also of factories, until 1903, when factory production reached its highest point with an output of 1,996,377 pounds of cheese and 895,086 pounds of butter. Then followed a period of decline in which the factory production of cheese was lowest in 1912 with 1,022,646 pounds and of butter in 1909 with 645,779 pounds. The hand separator and the high prices being paid in local markets cause many farmers to leave the factories and make butter at home. Another reason for the lessened factory production, as given by the farmers, was the difficulty in procuring suitable labour willing to work seven days in the week—a condition that is necessary in dairy farming.

However, the last few years have again witnessed an increasing production, as evidenced by the factory output in 1919 of 1,256,388 pounds of cheese and 915,816 pounds of butter. The number of factories is less than half of those in existence in 1903, as many of the small country factories have been replaced by large, modernly equipped, central plants, to which are shipped the cream and milk of large territories which were catered to previously by several small factories. This represents a very distinct improvement since it prevents duplication of equipment, cheapens manufacture, and results in the output of a more uniform and higher quality of butter and cheese.

Dairy farming is undoubtedly the system making for the greatest returns from the land in any particular year, while at the same time it not only maintains but even increases the fertility of the farm occupied. Selling the raw product from the farm is not good farming and is not profitable in the long run. A wider realization of this basic fact is gaining ground and will result in a more general adoption of dairying and resultant improvement in general farm practice.

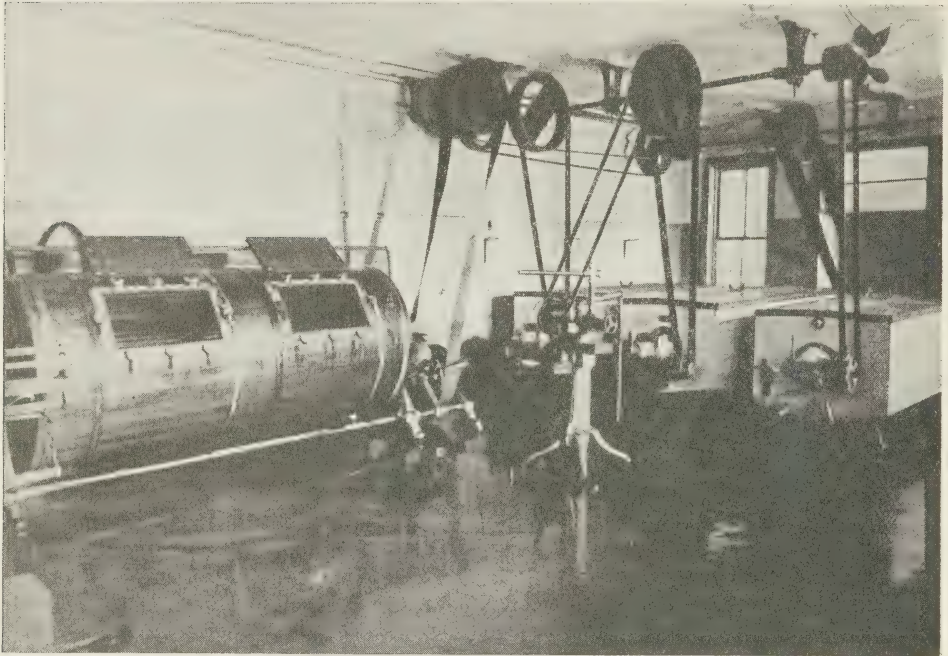
The dairy industry of the province is capable of being largely increased and developed, the demand at the present time being considerably in excess of the production. Every year sees large importations from Ontario and the western provinces of both cheese and butter. Producers are thus assured of a ready market for fine goods at a fair price.

Climatic conditions are such as to make it comparatively easy to produce milk and cream of good quality, one of the first essentials in the manufacture of "first-grade" dairy products. During the summer months the weather is not excessively hot, the nights, as a rule, being especially cool, a condition very favourable for keeping milk and cream sweet. Rainfall and moisture are usually sufficient to produce excellent pasturage, and most farms are well supplied with water from wells, brooks or springs.

The manufacture of cheese is carried on quite extensively in sections particularly well adapted to that phase of the industry, but the general conditions are more favourable to the development of the central co-operative creamery business, which usually

embraces the manufacture of butter and ice-cream and the sale of table cream and buttermilk. While the districts are somewhat scattered, the railway accommodation, shipping privileges and the excellent system of public highways, which is being perfected, make the collection of cream and its transportation to a central creamery comparatively easy.

In the matter of markets, New Brunswick dairymen occupy a favourable position. The demand is in excess of the supply and importations are handicapped by the "long haul" with its added freight charges. An improved system of marketing has



Central co-operative creamery, Moncton.

been introduced by the formation of a "Cheese and Butter Board," with headquarters at Sussex. Here the buyers and salesmen meet at regular intervals and transact their business in the most approved manner. All offerings are made subject to Government inspection and grading which encourage the buyers to invest their money with every confidence.

An efficient system of practical instruction and inspection is maintained by the Provincial Dairy Division, whereby the factory and creamery men receive assistance in meeting the various problems and difficulties which they may encounter in connection with their work from time to time. Practical advice and help is also rendered the producer, which enables him to produce the best quality of raw material in the most economical manner. Cheesemakers, buttermakers and milk-testers are encouraged by free transportation to attend the Maritime Dairy School at Truro, which is maintained jointly by the Departments of Agriculture of Nova Scotia, Prince Edward Island, and New Brunswick.

The following list shows the location of the cheese factories and creameries by counties; figures dealing with the production of cheese and butter for a number of years are also included:—

BUTTER PRODUCTION, NEW BRUNSWICK CREAMERIES, 1919.

Name of Creamery.	County.	Manager or Secretary.	P.O. Address.	No. of Patrons.
Midland.....	Albert.....	G. J. Goggin....	Elgin.....	13
Woodstock.....	Carleton.....	Geo. Ranson....	Woodstock....	110
Evangeline.....	Kent.....	F. Vautour.....	St. Louis.....	58
Sussex C. & B. Co.....	Kings.....	A. C. McCully....	Sussex.....	150
Jeffries' Corner.....	Kings.....	N. W. Eveleigh..	Sussex.....	45
Lower Millstream.....	Kings.....	J. E. McAuley..	Lr. Millstream..	15
Norton.....	Kings.....	W. A. Reynolds..	Norton.....	23
Madawaska.....	Kings.....	Ben Gallant....	Albertine.....	270
St. Basile.....	Madawaska....	Greg. Poqrin...	St. Basile.....	33
St. Andre.....	Madawaska....	Fred. Marquis..	St. Andre.....	73
Lancaster Dairy.....	St. John.....	A. Stern.....	St. John.....	34
Standard.....	St. John.....	T. E. Robinson..	St. John, 119 Main.	50
Pacific Dairies.....	St. John.....	F. J. Donegani..	St. John, 680 Main.	50
St. John Creamery.....	St. John.....	W. H. Bell.....	St. John.....	46
Farmers' Co-operative.....	Westmorland...	J. P. Simmonds..	Moncton.....	602
Victoria Mills.....	Westmorland...	L. J. Blakney...	Wheaton Mills..	100
Petitcodiac.....	Westmorland...	S. L. Stockton..	Petitcodiac....	25

	Lbs. Butter made.	Average Price per pound.	Value of Butter*
In 1919, 17 creameries reported.....	915,816	cts. 55	\$ 504,602 22
In 1918, 15 creameries reported.....	660,804	45	297,397 80
In 1917, 14 creameries reported.....	500,050	39-93	199,686 33

CHEESE PRODUCTION IN NEW BRUNSWICK, 1919.

Name of Factory.	County.	Secretary.	P.O. Address.
Bathurst.....	Gloucester.....	M. D. Simard.....	West Bathurst.
Belleisle.....	Kings.....	R. H. Pearson....	Belleisle Creek.
Berwick.....	Kings.....	J. A. Northrup....	Millstream.
Carsonville.....	Kings.....	P. H. Leiper.....	Carsonville.
Collina.....	Kings.....	O. W. Kierstead..	Collina.
Clover Hill.....	Kings.....	R. A. Cassidy....	Sussex, R.R. No. 3.
Cornhill, C. & B. Co.....	Kings.....	Chas. Burlock....	Anagance.
Cornhill Corner.....	Kings.....	A. T. Stockton....	Cornhill.
Canaan Road.....	Kings.....	M. H. McFarlane..	Butternut Ridge.
Hammond Vale.....	Kings.....	R. Jas. Myles....	Hammond Vale.
Head Millstream.....	Kings.....	W. S. Mason.....	Head Millstream.
Havelock.....	Kings.....	H. A. McMackin...	Butternut Ridge.
Lower Ridge.....	Kings.....	T. G. Perry.....	Butternut Ridge.
Mt. Middleton.....	Kings.....	N. W. Eveleigh....	Sussex.
Newtown.....	Kings.....	H. R. Keith.....	Newtown.
Pearsonville.....	Kings.....	J. S. Gamblin....	Collina.
Penobquis.....	Kings.....	A. Sears.....	Penobquis.
Lake Baker.....	Madawaska....	Louis Bouchard...	Lake Baker.
Ledges.....	Madawaska....	Arsen Pelletier..	Ledges.
Rockway.....	Madawaska....	Germain Toussaint..	Plourd.
St. Jacques.....	Madawaska....	O. N. Martin.....	St. Jacques.
Lewis Mountain.....	Westmorland...	H. F. Hughes....	Petitcodiac.
Manhurst.....	Westmorland...	N. W. Eveleigh....	Sussex.
Killam Mills.....	Westmorland...	H. F. Hughes....	Petitcodiac.

In 1919, 24 factories operation, 675 patrons.

	Lbs. Cheese manufactured.	Average Price per lb.	Value of Cheese
		cts.	\$ cts.
1919.....	1,256,388	27.66	347,772 02
1918.....	1,174,362	22.43	264,304 05
1917.....	1,115,753	21.7	232,527 36
1914.....	1,022,026	13.5	138,714 73

Poultry-raising

This is a young but growing industry in New Brunswick. No doubt since the arrival of the early settlers poultry has been raised on the farms and town lots, but it has not been considered an important part of the agricultural activity of the province. Poultry work has always been part of the daily routine of the farmer's wife. It is, however, rapidly assuming a much more prominent position and is recognized as an essential part of well organized, diversified agriculture.

New Brunswick's climate is much more favourable to poultry production than is generally supposed. The last United States census showed the state of Maine leading the other states of the Union in the average production per hen. The climate in Maine is very similar to that of New Brunswick. It therefore stands to reason that our climate will at least permit of satisfactory production if the proper methods are employed. The greatest climatic handicap is the relatively late spring which somewhat delays natural hatching processes but artificial methods render this by no means an insurmountable barrier.

Land suitable for poultry-raising is available in practically all sections at very reasonable prices. Lumber for house construction can be obtained at very low cost. A sufficient variety of suitable grains to make a complete grain ration can be grown in most sections. The combination of poultry-raising and fruit-growing or mixed farming offers striking inducements. There is no danger of over-production.

New Brunswick's geographical position is a distinct advantage over the other provinces in connection with Canadian export trade with European countries. During the season of 1919 Canada exported about 5,600,000 dozen eggs, a large percentage of which went to European buyers. St. John is one of the nearest Canadian ports to this market. Practically all the settled portions of the province are within easy access to this port. St. John also serves as a convenient shipping point to the large consuming centres of the Eastern States and to the West Indies.

The various steamship lines operating from St. John require enormous quantities of poultry and eggs for their ocean-going vessels. At present, even these are secured from points farther west, particularly Toronto and Montreal, which indicates the opportunities open to poultry raisers in the province. These markets at present obtain very large quantities of poultry products from Western Canada and would serve as dependable home markets for New Brunswick poultry and eggs which may be obtained at a fraction of the freight rate on western supplies.

Prices of poultry and eggs have advanced at a remarkable rate during the past five years; they are still advancing; and they will continue to advance. Recent scientific discoveries have shown the egg to be one of a very limited class of foods containing elements wholly indispensable to the human race. This alone vouchsafes their position in our national or universal dietary and reacts in an ever-increasing demand.

The number of poultry in New Brunswick in 1918 was placed at 674,412. In 1919 it had grown to 796,698, an increase of 122,286, or 18 per cent. This is a remarkable growth. However, the average farm flock does not exceed 20 to 25 birds, which number may be increased three or fourfold before the industry will have assumed the proportions its importance justifies.

New Brunswick is rich in lakes, rivers and brooks. These provide admirable conditions for the growing of ducks and geese, which are among the most remunerative of farm products. The great number of farms bordering on the innumerable water bodies of the province have choice feeding grounds for birds of this class. Under such conditions a flock of 40 or 50 water-fowl may be grown practically free of cost.

Turkeys are grown extensively in some sections. The natural foraging inclinations of this noble bird may have unrestricted freedom on the average New Brunswick farm without the destruction of other crops. Unlimited woodlands in the higher and drier parts are their "happy hunting grounds." In many sections of the continent they have become practically extinct, due to soil contamination by virulent disease organisms and improper breeding methods. To prevent this fate to the industry in New Brunswick, a plan is under consideration by the Poultry Division of the Department of Agriculture for the introduction of a high-class of breeding stock with strong vitality to be the nucleus of a system of supervised and approved flocks for extensive distribution.

During the seasons of 1918 and 1919 the Provincial Government imported nearly 50,000 hens' eggs for hatching, of the highest laying strains available, and distributed them to boys' and girls' poultry clubs and other breeders throughout the province. These came mostly from Ontario and Maine, where egg production is a primary object in modern poultry-raising. All eggs were of one good utility variety, Barred Plymouth Rock. Results in all sections of the province and in laying contests in other provinces where owners of this stock have sent birds for competition prove the soundness of the policy. This stock furnishes an excellent foundation for a really great development of the poultry industry. The standardization of the stock is a real asset which helps to advertise the industry in outside points and creates a huge demand for stock and eggs of these highly productive strains.

The unprecedented development of poultry culture during the past two decades is one of the outstanding features of Canadian agriculture. The present status of the industry was scarcely dreamed of at that time. New Brunswick will share in the developments of the next decade if her farmers and poultry raisers vigorously uphold the principles of standardization and modern methods of increased production and stock improvement.

Bee-keeping

Honey production is an industry that has received increased attention since the war period caused the price of sugar to soar to almost prohibitive heights.

There is evidence to show that bees have been kept in New Brunswick since its earliest settlement. Hives of the old type with the glass in the back have recently come to light with dates of hiving swarms inscribed thereon more than one hundred years ago. But little Government attention has been given to this work until the fall of 1917 when an appropriation sufficient to pay the salary of an apiarist, was provided. Since that time the interest in bees and honey has greatly increased. Nearly every bee-keeper has been visited and instructed in the use of modern equipment and methods. In the spring and early summer months, beginners are given especial assistance, the months of May and June being devoted to this work. These improved methods have been adopted by many bee-keepers all over the province with the result that over one hundred per cent more honey was placed on the market in 1919 than the previous year. One lady bee-keeper reported 1,795 pounds of honey from twelve hives.

Clover is the principal source of the honey flow, but this is supplemented by fall flowers of the golden rod and aster types and many others of lesser importance. In the northern counties, fireweed or great willow herb abounds in the newly-settled sections and supplements the flow from white and alsike clover.

A hive on scales at the Dominion Experimental Farm, Fredericton, registered an increase of 58 pounds in four days as follows: June 24, 11 pounds; 25, 21 pounds; 26, 16 pounds; 27, 10 pounds.

The average crop per hive, reported to the Department of Agriculture from 135 apiaries, was 68 pounds. The total number of bee-keepers listed is close to 700. The estimated output for the province in 1919 was valued at \$74,562.

Because of better grading the product placed on sale has been very greatly improved. New Brunswick honey, when properly graded, is equal to the best from any other province or country and the demand is more than keeping pace with the supply.

Very little disease is found in New Brunswick. The few affected localities are being watched closely and the disease may be considered under control.

Most of the bees in New Brunswick are wintered in cellars but where cellars have given unsatisfactory results, they may be wintered in packing cases on their summer stands.

New Brunswick bee-keepers have an association which, in 1919, had a membership of one hundred and twenty, and which purchases its supplies co-operatively.

Fruit-growing

PROSPECTS FOR THE APPLE INDUSTRY

The determination of the prospects for apple growing in Canada or in any of its several provinces involves a consideration of the conditions and prospects of the industry in the United States. In this connection we cannot do better than quote the United States Department of Agriculture, which, in a special publication entitled, "The Commercial Apple Industry in the United States," prepared in 1918 by J. C. Folger, Fruit Crop Specialist, of the Bureau of Crop Estimates, says, under the heading of "Future of the Apple Industry":—

"Apple production does not respond quickly to supply and demand, and for this reason there has been more or less instability in the matter of prices. It requires several years for trees to come into full bearing, and over-production as the result of excessive planting is not felt for a considerable period. There seems no reason to believe that over a period of years, taking the good with the bad, apple acreage as a whole will make any materially better returns than the average farm crop, yet apples will always afford better opportunity for individual efforts of the exceptional grower.

"Aside from the possibility of certain local 'boom development' and the planting of unsuitable land, there seem many reasons for viewing the future of the apple industry as promising. In speculating upon future production, one instinctively turns to New York State. Unquestionably, western New York is approaching its maximum production. The Hudson valley includes many new orchards, but in the more important parts of western New York, the average orchard is more than forty years old. Nowhere in the Eastern States, with the exception of the Shenandoah-Cumberland region, does there seem likely to be any early material increase in production. Many of the old trees all through the East are dying out. On the other hand, the Pacific Northwest can be expected to show a constantly increasing production for several years. A very large percentage of the new plantings in the decade 1900-1910 occurred in the Northwest. These plantings are to a large extent commercial. Taking the United States as a whole, there has been very little planting in any locality since 1910. It would, therefore, not seem improbable that this lack of planting will have a pronounced effect, beginning about 1925, if not sooner.

"With the cessation of war, the export markets, which normally furnish an outlet for approximately 10 per cent of the United States commercial crop, will be opened. The probable extension of foreign markets will increase this per-

centage. While a moderate increase in apple production seems probable, the increase in population and the movement toward the cities are factors likely to increase consumption very materially. Furthermore, the improved marketable quality of commercial apples is unquestionably stimulating the demand for this fruit among all classes. Better means of distribution and wider use of the apple combine to give a decidedly hopeful outlook to the commercial apple industry."

Coming to Canada we find an increased production in British Columbia but not sufficient to have any marked influence on the situation, a practically stationary production in Nova Scotia, and a decreased production in Ontario and Quebec.

Speaking of the apple industry in Ontario, in the October (1919) issue of the *Canadian Horticulturist*, Professor J. W. Crow said: "The depletion of our apple orchards has been so serious that Ontario will soon be reduced to the necessity of importing apples to meet our home requirements. Our orchards have not been taken care of as they should have been, and many of them are rapidly dying out. This condition existed even previous to the war, and during the past five years has been intensified by the shortage of labour. Possibly not over one per cent of the orchards of the province have been given proper attention during the past few years.... It is evident from this that the industry has suffered a severe blow and that many years will be required before normal production will be restored."

In the province of Quebec the situation is far worse, for a recent census of apple trees there showed a loss of approximately 1,000,000 trees since 1911, or nearly one-half the bearing trees. This was largely due to the severe winter of 1917-18, but the cause went farther back than that, as many orchards were dying through old age and neglect previous to that winter. As yet, this great loss is not being replaced by new plantings.

In Europe the orchard situation is extremely backward, having suffered heavily from the war. The bearing trees have been neglected and are ruined in the war area, and in great areas where the actual fighting did not take place they have been very much neglected.

In 1918, following one of the most severe winters on record, our orchards appeared to have sustained but little permanent injury, notwithstanding the fact that heavy winter-killing and injury resulted in sections hitherto considered more favourable for apple growing than New Brunswick. This judgment of light injury to our orchards was confirmed this year, when those trees and varieties which showed signs of injury from the winter of 1917 and 1918, could not be detected from the others—blooming and bearing equally as well and looking as vigorous. We are now able to say that the damage to apple trees in this province from the winter of 1917 and 1918 was remarkably light and the recovery as complete as could be required, in marked contrast to Quebec, Maine and Eastern Ontario where very extensive damage was reported in the summer of 1918 and where many trees that lived through that summer succumbed to last winter, though it was mild and favourable.

The foregoing facts indicate that this is indeed an opportune time to extend the plantings of apples in New Brunswick. The experience of recent years in this province has demonstrated that commercial production of high quality apples that are in good demand on a variety of markets is practicable and fraught with no greater danger than in many other apple sections of the Dominion. The ability of our growers to realize top prices for their apples on the largest competitive market in Canada (Montreal), and to do that practically at the first attempt, has added greatly to their confidence in their ability to grow good apples and market them successfully in open competition with the apples from long established fruit-growing sections, hitherto considered as more favourably adapted.

It is almost certain that the price of apples will be high for many years. In the great neglect of European orchards, the shortage of seedling stock, increased prices for everything and the decreasing condition of the orchards in Quebec, Ontario and parts

of the Eastern United States, lies the opportunity of the present for the enterprising fruit grower in New Brunswick and Eastern Canada. There is no place to-day for the bogey of over-production preached so often a decade ago.

It is altogether probable that for some years to come Canadian markets will consume the small surplus of New Brunswick apples with the most profit and to the best advantage. The increased production of the future will probably to a large extent be marketed in Europe, and it is gratifying to note some marked advantages which this province has in catering to such a trade. Our apple lands being from 800 to 3,000 miles closer to the European markets than the large producing sections to the west of us, not only is the cost of transportation less, but the fruit can be placed in the consumer's hands in better condition with less difficulty. Added to these advantages is the relatively low price of land here and comparative cheapness of production, so that even should the other apple sections of the North American continent increase their exportable surplus, which is by no means a certainty, the prospects for commercial orcharding in New Brunswick would still be bright.

SOIL AND CLIMATE SUITABLE FOR FRUIT-GROWING.

Convincing evidence of the adaptability of the soil and climate to the production of apples is furnished by the abundance of wild apple trees growing on the roadsides and in fence corners. Even in the woods they may be found, having sprung up from the seeds of apples dropped or thrown away by some wandering game hunter or lumberman. The soil of the chief fruit lands is for the most part a clay loam, with a medium to a gravelly subsoil, having the requisite depth for the penetration of the roots, being easily worked, affording good natural drainage and holding the heat well, four very important essentials in apple-growing.

The springs are not very early, and operations do not begin on the land till the middle of April, or later. In fact, to quote the late Mr. Francis Sharp, of Woodstock—the great pioneer of apple-growing in New Brunswick: “The province, as compared with England and the rest of Europe, has no spring. As soon as the winter is over summer is at hand. Our prevailing wind is west and northwest and as long as the vast body of land lying to the north and west of us is covered with snow, no amount of weather warm enough to develop growth is possible. These winds keep back our spring long after the same latitude in England, nursed by the mild breezes of the wide Atlantic, has started into growth. When the snow to north and west of us disappears, spring bursts upon us with a warmth defying all frosts which would cause the failure of the apple crop.” The summer climate, while affording abundance of sunshine and heat for the proper growth and maturity of the apple and other fruits, is yet remarkably free from the prolonged dusty, dry spells and hot murky nights too often experienced farther west. The rainfall, too, is ample, precluding any necessity for irrigation, as good cultivation will always carry the growth of crops through any period of drought yet experienced.

THE DOMINION EXPERT'S REPORT ON FRUIT-GROWING.

In the early summer of 1911 Mr. W. H. Bunting, of St. Catharines, Ont., one of the largest and best known fruit growers in Canada, was appointed by the Federal Government to investigate and report on the fruit-growing conditions and prospects of the various provinces of the Dominion. The following is the abbreviated report on New Brunswick, as read by Mr. Bunting at the Third Dominion Conference of Fruit Growers, at Ottawa, February 16, 1912:—

“I looked forward with a great deal of interest to a visit to New Brunswick, as I had heard so much of the St. John valley and the opportunities for fruit-growing which were just beginning to be realized by the residents of this beautiful district.

"Fruit has been grown for a good many years in considerable quantities in the counties included along the valley of St. John river and in portions of Charlotte, Albert, and Westmorland. Many fine orchards attest the capabilities of this province to produce fruit of splendid colour and quality. The late Francis P. Sharp was probably one of the first to undertake the growing of fruit in anything like a commercial way in this province. He was an enthusiastic, enterprising investigator, and with wonderful optimism began many years ago to secure, develop and plant fruit on a large scale in Carleton county. The result of his work is still to be seen in the vicinity of Woodstock. It is only within recent years, however, that definite data have been secured and made available to the general public as to the varieties of fruit which may be planted commercially with every confidence and hope of profit. The Provincial Government, through the Secretary of Agriculture and the Provincial Horticulturist, has put new life into the New Brunswick fruit industry, and this province is now taking essential steps to fill its proper place as an important fruit-producing section.

"No finer strawberries, raspberries, or other small fruits are grown anywhere in the Dominion. The list of apples recommended for New Brunswick covers the season and provides a class well suited for export shipment, as well as for supplying the local markets. With cheap and rapid transportation by water, with an overseas market very close at hand, with plenty of suitable land at a very moderate cost, with the knowledge that has been secured as to the proper varieties to plant, and with the active co-operation of the Government, the success of New Brunswick as a fruit-producing area seems assured."

VARIETIES AND THEIR QUALITY

One advantage that New Brunswick apples possess lies in their high colour and singular beauty of appearance. These two points alone would ensure a ready sale, were even quality lacking, but fortunately the varieties of apples raised to the best advantage to the province are all of high quality, Wealthy, Dudley, Fameuse, McIntosh Red, Golden Russett and Northern Spy being among the best of dessert apples. The Duchess, Wolfe River, Milwaukee, Alexander, and Bethel also grow exceedingly well and find a ready sale.

Regarding quality, Mr. W. T. Macoun, Dominion Horticulturist, speaking at the banquet of the New Brunswick Fruit Growers' Association, on November 1, 1911, stated that "Nowhere in all Canada was the McIntosh Red apple being raised to greater perfection than in the province of New Brunswick." This in itself is most convincing evidence since the McIntosh Red is considered by many people to be the best dessert apple grown in Canada. Mr. A. McNeil, late Chief of the Fruit Division of the Dominion Department of Agriculture, reported as follows on samples of the Bishop Pippin apple, not of the finest, but of the general run of the fruit: "I had the pleasure of showing these specimens to several good fruit men here (Ottawa) and all were enthusiastic. They were particularly struck with the fact that the texture of the skin was so clear compared with the ordinary Bishop Pippin or Bellflower. The colour is not yet as good as it will be, but it is most excellent even now." Professor J. W. Crow, of the Ontario Agricultural College, after attending the apple show in 1910, said in part, "A most striking feature was the remarkably high colour of the fruit. If the fruit exhibited is a fair sample of what New Brunswick can grow, it is safe to say that Ontario comes in second in the matter of colour. Of course, it must be borne in mind that the varieties principally grown in New Brunswick are the highly-coloured fruits, but even in other varieties New Brunswick would compare very favourably with anything produced in Ontario."

RATING AND SALES ON CANADIAN MARKETS

For the past four years the New Brunswick Fruit Growers' Association, acting with the assistance of the Horticultural Division of the Department of Agriculture, has shipped apples in increasing quantities to the Montreal market.

The high standard of grade and pack maintained from the first was even improved in 1919, and the prices realized were as high and in some cases, higher, than any pack for apples from other provinces.

The prices realized in 1919 at Montreal for eight of the leading varieties were as follows:—

SALE PRICE PER BARREL AT MONTREAL.

Variety.	Grade	Highest.	Lowest	Average.
Dudley.	No. 1	\$ 7 00	\$ 5 50	\$ 6 34
	No. 2	6 00	5 00	5 57
	Domestic	5 00	5 00	5 00
	No. 3	4 50	4 25	4 32
Alexander.	No. 1	7 00	5 50	6 31
	No. 2	6 00	4 75	5 28
	Domestic	5 00	4 25	4 73
	No. 3	4 50	3 50	4 12
Wealthy...	No. 1	7 25	6 00	6 52
	No. 2	6 00	4 25	5 14
	Domestic	5 00	4 50	4 99
	No. 3	4 75	3 75	4 27
Fameuse.. . . .	No. 1	10 00	7 00	8 96
	No. 2	8 00	7 00	7 69
	Domestic	7 50	6 50	7 09
	No. 3	6 00	4 50	5 65
McIntosh...	No. 1	12 00	9 00	9 95
	No. 2	9 00	8 00	8 25
	Domestic	9 00	7 50	8 03
	No. 3	6 00	5 50	6 00
Milwaukee...	No. 1	7 00	6 50	6 54
	No. 2	6 00	5 00	5 12
	Domestic	5 50	5 50	5 50
	No. 3	4 00	4 00	4 00
Golden Russett.. . . .	No. 1	9 00	9 00	9 00
	No. 2	7 00	7 00	7 00
	Domestic	....	....	....
	No. 3	6 00	6 00	6 00
Bethel.. . . .	No. 1	8 00	8 00	8 00
	No. 2	6 50	6 50	6 50
	Domestic	6 00	6 00	6 00
	No. 3	4 50	4 50	4 50

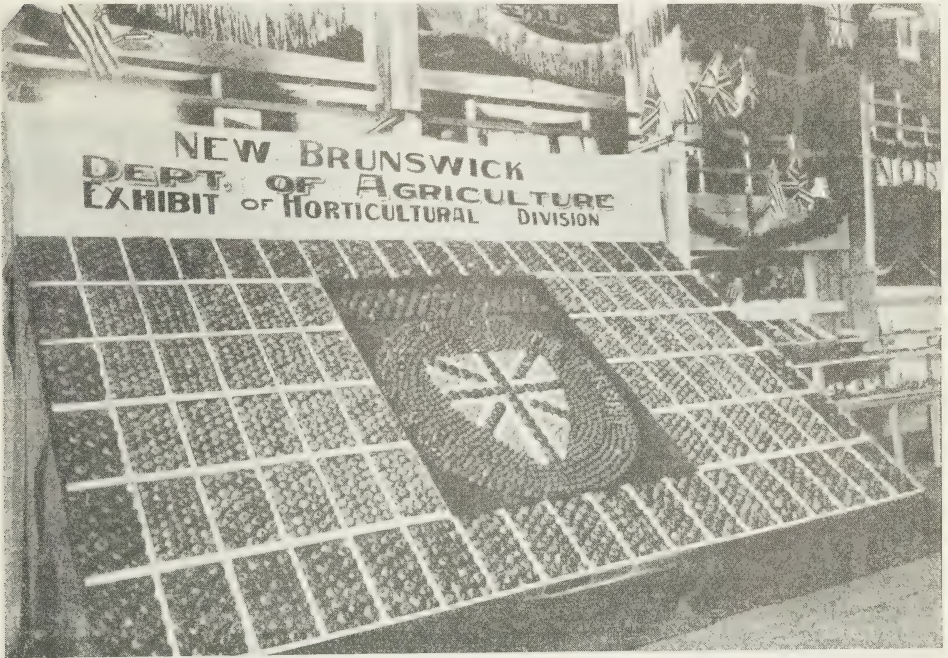
WHERE THE FRUIT LANDS ARE

In point of land available, range of varieties profitably grown, and marketing facilities, the lower St. John valley constitutes an important section. Acknowledged to be one of the most fertile and beautiful valleys in the world, it awaits only the systematic development of its fruit lands to rapidly blossom forth into one of the best apple valleys in all Canada. Since no definite soil survey has ever been made through this country, it is impossible to state how many acres of first-class fruit lands it contains. Suffice it to say that along the river much of the land has an admirable slope and is excellently adapted for apple-growing. Some of the soil farther back is also first-class and considerable areas of excellent apple land are to be found even twenty miles or more from the river.

There are also many acres of high intervalle land, in the vicinity of Sheffield and Maugerville, which would yield handsome returns if planted to apples. The soil is a dark loam, several feet deep, and is exceedingly fertile, being the old river bed. Here

may be seen apple trees nearly 100 years old, still strong, thrifty, and bearing fruit. Farther inland, back on the highland around French lake and Maquapit lake, are areas of soil similar to that on the western bank of the river—much of it first-class apple land, and still more of it in the Grand Lake region and farther south in the sections bordering Washademoak lake and Belleisle and Kennebecasis bays.

The upper St. John valley, between Fredericton and Woodstock, while not adapted to such a wide range of varieties as may be produced below Fredericton, has proved itself adapted to the production *par excellence* of early or mid-winter fruit, and at



Display of apples at Fredericton and Chatham Exhibitions, 1919.

Woodstock, 160 miles from St. John, there may be found to-day the relics of the old Sharp orchards—apple trees planted in the tens of thousands by Francis P. Sharp, one of the most noted horticulturists in America. These orchards in their prime were the wonder and envy of all who saw them, and their produce sold for higher prices on the Boston market than locally-grown fruit. With the death of Mr. Sharp these magnificent tributes to the productive powers of New Brunswick's soil and climate gradually fell into decay.

Little is known at present of the amount of land available in the country embraced in the upper St. John valley; but as the St. John Valley railway is now completed between Centreville, Woodstock, Fredericton and Gagetown, a distance of about 120 miles, skirting the west bank of the river, between these points, large blocks of first-class fruit land situated between Woodstock and Fredericton, and hitherto unattended by direct steamship or railway service, are now within easy communication of the social and marketing advantages possessed by the lower St. John valley.

In some respects portions of Albert county present conditions akin to those of the famous Annapolis valley in Nova Scotia, and produce to-day specimens of the Gravenstein, the Northern Spy, Ribston Pippin and other apples, the equal in flavour of the Nova Scotia product. Undoubtedly there is a very bright future ahead of this district

in apple-growing, as the proximity of the thriving town of Moncton, with its 20,000 people, and Canadian National Railway headquarters, together with the tempering influence of the Petitcodiac river and the water communication of the bay of Fundy, are strong points in its favour.

In the southern part of Charlotte county, in the vicinity of St. Stephen and St. Andrews, and notably in the lower valley of the St. Croix river, the milder climate is more favourable to the production of the tenderer varieties, such as King of Tompkins, Northern Spy and Rhode Island Greening, and good possibilities in commercial orcharding in that section await development. It is fed by two branches of the Canadian Pacific railway and a line running direct to St. John. It also has a splendid outlet for its product by ocean transportation to St. John, and thence to all parts of the world.



Crop of strawberries at Springville, St. John river valley.

At Chartersville, Westmorland county, four miles from Moncton, is to be found the beautiful large orchard of Mr. Roy Charters, in which over thirty different varieties of apples are grown successfully. At Shediac cape, right on the Atlantic waters, and almost on the border between Westmorland and Kent counties, on a beautiful piece of level land, lies one of the largest bearing orchards in New Brunswick—planted and owned by Welling Bros. There are over 2,000 trees in this orchard, mostly apples and plums, with some pears and cherries. Mr. Welling has, himself, grown on the place over seventy different varieties of tree fruits—a wonderful testimony to his ability and the adaptability of this section to fruit production. These two orchards are not the only ones, there being many similar ones throughout the county, but they serve to indicate the future prospects for apple-growing in Westmorland and Kent counties.

SMALL FRUITS.

To quote the words of Mr. Bunting, the Dominion fruit expert, previously referred to; "No finer strawberries, raspberries, or other small fruits are grown anywhere in the Dominion."

In addition to supplying the local markets, a considerable trade has been developed with Montreal, New Brunswick strawberries maturing and being placed on that market after the Ontario and Quebec berries are over. In this connection we quote from the report of the Provincial Horticulturist for 1919:—

"For strawberry growers the past season was one of the most successful and profitable in recent years. The plants wintered well and gave a good average or little better than average yield, the weather in the blooming and fruit maturing period being quite favourable, except for a few cases where drought shortened up the crop. The prices secured were high but not unduly so, considering the increased cost of production and the detailed work and risk involved.

"A large part of the crop in the Hampton, Bloomfield and Apohaqui districts was shipped to Montreal, one firm alone receiving 25,000 boxes at prices returning to the growers twenty cents or better, according to whether bought or shipped on consignment, and quality, condition and grade of fruit. The production in this section is estimated at 100,000 boxes and the 1920 acreage at a slight decrease over 1919." From the Clifton, Bayswater, Whitehead and Long Reach sections, Col. O. W. Wetmore reports as follows: "The past season in the lower end of Kings county has been a most favourable one as the crop was fairly good and prices the best for thirty years. Some of the best shipped to Montreal brought twenty-nine cents per box, f.o.b. St. John, and the local market was not much below twenty cents except very early in the picking season. All late berries sold well. The stand of plants set this year is not quite so good on an average as last year, still there will be quite an acreage the coming season. Where berries can be picked and shipped the same day, arriving on the Montreal market the following morning, there seems to be a good demand at good prices. There seems to be more demand for berries every year for preserving and the price will probably remain fairly good, although the price of last year will not likely be repeated."

Raspberries, blackberries, gooseberries and currants are grown successfully, there being a demand for considerable quantities to supply to local markets. The difficulty of getting raspberries and blackberries to outside and distant markets prevents any large increase in the cultivation of these crops at the present time. Wild raspberries, strawberries, blueberries and cranberries grow in abundance. Blueberries grow wild in enormous profusion and are canned in large quantities. They are also sold on the local markets and exported to some extent in the fresh state.

FORESTS *

From early times the forest products of New Brunswick have held a first place in its exports. Although a large section of the province is admirably suited to agriculture, yet lumber has remained pre-eminent. The settled districts are, as yet, confined principally to the river valleys and the coast line, the interior forming a vast timber preserve. Of the seventeen and a half million acres in the province about seven and a half million acres are Crown lands and are mostly timbered. These lands and also private timber lands are indicated on the map accompanying this report.

* Much of the material in this section was furnished by the Department of Lands and Mines, Fredericton, N.B.

Owing to the fact that the province is everywhere drained by large rivers with innumerable branches, lumbering can be carried on advantageously wherever there is timber, as from all points in the province logs can be driven down these waterways to market.

Although much of the forested area of the province has been cut over, and some portions badly burned, yet there is a great stretch of Crown lands in the interior, north of the Southwest Miramichi, 80 miles wide and 100 miles long without a habitation of any kind except the lumberman's or trapper's shanty. This great area is fairly free from the ravages of fire and covered with all kinds of valuable timber. The greater part of this territory is unfit for cultivation, lying on the granite and boulder formation, although the northern section, in its approach to the Restigouche river, runs into the Upper Silurian formation and consequently has good deep soils. Everywhere over this belt both black and white spruce abound, some pine, large quantities of the finest and largest cedar in Eastern Canada, and vast amounts of hardwoods that have scarcely been touched. New Brunswick has here, and in her other forested areas, a heritage that, with proper conservation, will remain for all time a great source of revenue.

Forest Survey

The province is undertaking an extensive forest survey or stocktaking of her timber and soil resources. Work on this survey was begun in 1916 and at the close of 1919 nearly thirty per cent of the Crown lands had been mapped and estimated according to the most modern system, by the staff of foresters employed by the Provincial Government. In this survey all lands fit for agriculture are noted and classified, quantities and distribution of forest species are ascertained, and the accessibility of timber and the improvements of streams that may be required to increase driving facilities are estimated. One of the notable features of the survey is the running of block lines through the forests and the establishment of posts along these lines properly marked so as to be readily used by the woodsmen in their work of locating logging operations, etc.

According to the last report issued by the Director of the Forest Survey, dated October 31, 1919, information had been compiled on 2,037,295 acres, or about 29 per cent of the Crown lands. A brief summary is as follows:—

Softwood forests.. . . .	880,575	acres or	43.2	per cent.
Mixed hardwood and softwood forests.. . . .	584,667	"	28.7	"
Hardwood forests.. . . .	86,321	"	4.2	"
<hr/>				
Total area merchantable forests.. . . .	1,551,563	"	76.2	"
Burnt over lands.. . . .	361,245	"	17.7	"
Barrens, bogs, swamps, lakes, cleared lands, etc..	124,487	"	6.1	"
<hr/>				
Total area so far examined.. . . .	2,037,295	"	100.0	"

The amount of timber found on the timbered area shown above is estimated as follows:—

Merchantable softwoods.. . . .	1,358,478,139	ft. or 61.47 per cent.
Merchantable hardwood.. . . .	851,532,221	ft. or 38.53 per cent.
<hr/>		
Total.. . . .	2,210,010,360	ft.
Estimate of undersized spruce and fir down to 8" stump.. . . .	1,313,737,500	ft.
<hr/>		
Grand total.. . . .	3,523,747,860	ft.

The above area covers 29 per cent of the Crown lands but cannot be said to be an average of the widely varying conditions yet to be met with in the province.

FOREST SURVEY
CROWN LAND DEPARTMENT
NEW BRUNSWICK

Forest Trees of New Brunswick
showing proportion of each species
based on commercial estimate
on 2037295 acres.

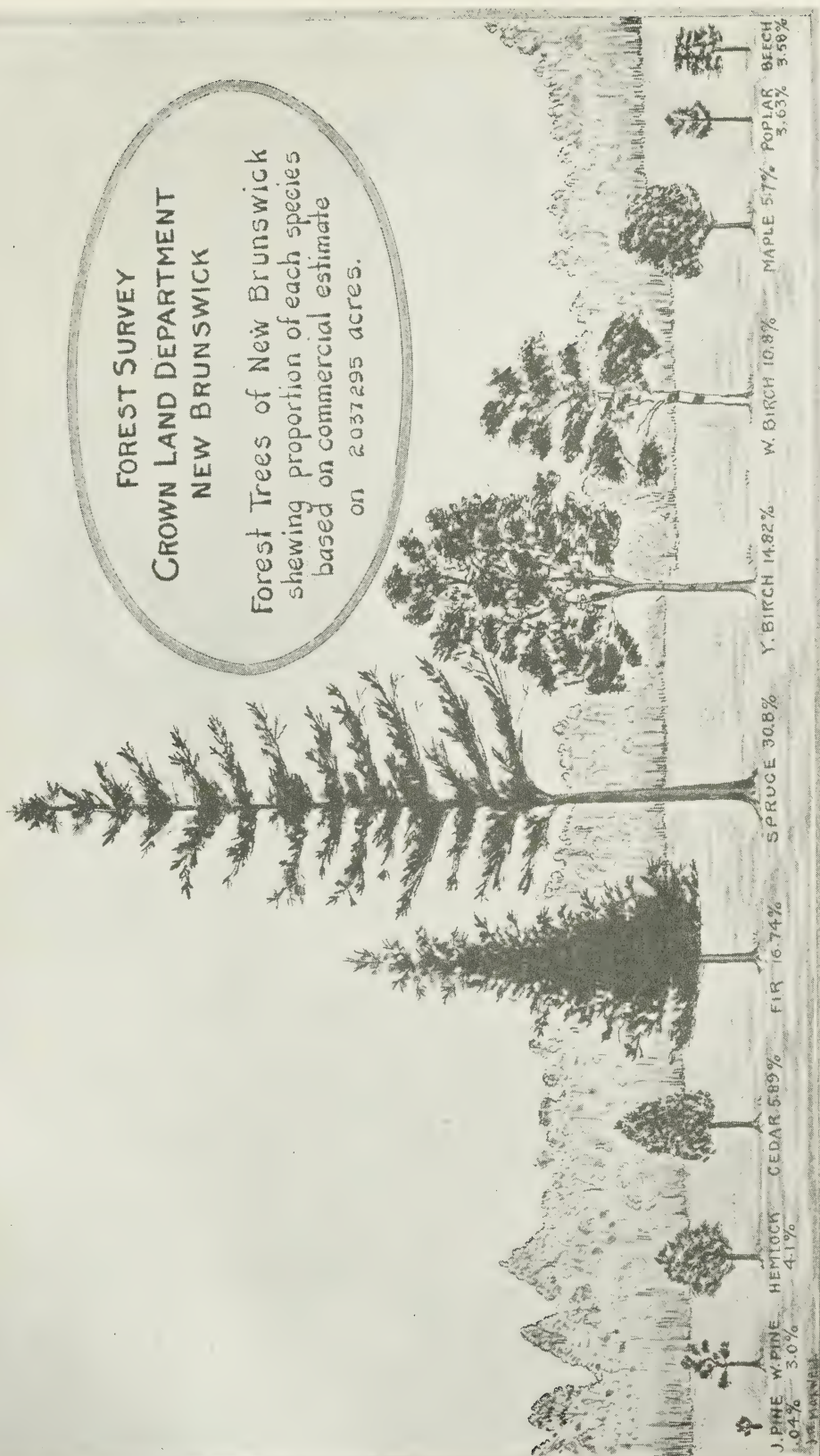


Diagram showing proportion of forest trees.

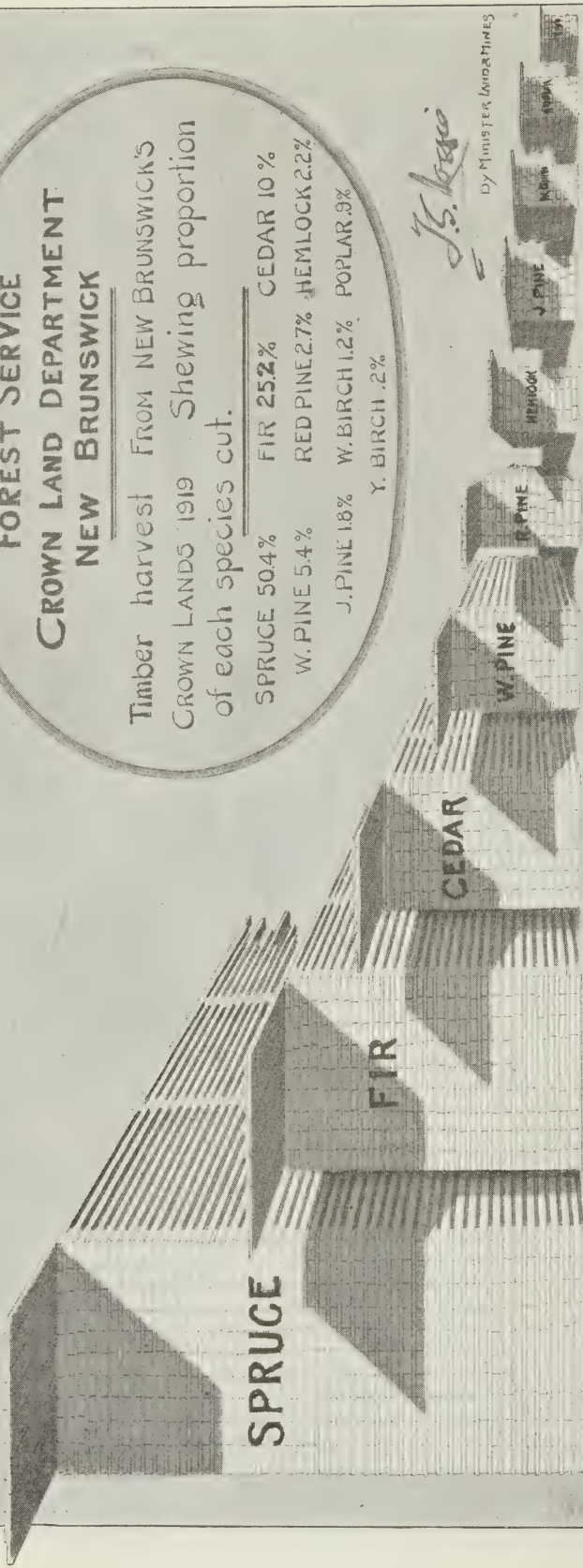
**FOREST SERVICE
CROWN LAND DEPARTMENT
NEW BRUNSWICK**

Timber harvest from NEW BRUNSWICK'S
CROWN LANDS 1919 Showing proportion
of each species cut.

SPRUCE 50.4%	FIR 25.2%	CEDAR 10%
W. PINE 5.4%	RED PINE 2.7%	HEMLOCK 2.2%
J. PINE 1.8%	W. BIRCH 1.2%	POPLAR .9%
	Y. BIRCH .2%	

J. S. K. 1919

By Minister of Lands



The proportion of each species in the estimate of merchantable timber shown above is indicated very plainly in a plate accompanying this report, and is as follows:—

	Per cent.		Per cent.
Black, red and white spruce. . .	30.80%	Yellow birch.	14.82%
Fir.	16.74%	White birch.	10.80%
Cedar.	5.89%	Maple.	5.70%
Hemlock.	4.10%	Poplar.	3.63%
White pine.	3.00%	Beech.	3.58%
Jack pine or princess pine. . .	.04%	Other species . . . . .	.90%

Another plate accompanying this report shows the annual timber harvest on Crown lands and this indicates that while the province has vast areas of hardwoods they have been little developed as yet. Hardwoods are not so readily logged and cannot be floated down stream as can softwoods. Their uses are also more limited. Many species, particularly maple and birch, are very valuable, however, and efforts are being made to attract hardwood industries to the province. These are meeting with success and the hardwood stands, much of which are entirely suitable for flooring, furniture, turnery, etc., are being increasingly utilized. One company cut about a million and a half maple logs last winter for use in the manufacture of last blocks. The large stands of poplar invite the establishment of soda pulp plants for paper manufacture.

The softwood cut is used wholly for lumber and the paper industry, and the demand constantly exceeds the supply.

Utilization of Waste Products

In these days of scarcity and high prices the subject of the utilization of waste products assumes unusual importance. Chief among such substances that are worthy of investigation are sulphite liquor from pulp plants, and sawdust and small pieces of wood from saw-mills. From the two former, processes for the manufacture of industrial alcohol have been worked out and from the latter such articles as spools, brush backs, handles, etc., and, by distillation, charcoal, wood alcohol, acetic acid and acetone.

Administration and Revenue

Previous to the last three years it was the custom to employ scalers and rangers during the winter season only or when the lumber was being cut in the woods, but under the new Forest Act permanent rangers have been appointed who are on duty the entire year. These rangers have charge of scaling all lumber cut from Crown lands, the enforcing of logging regulations, the prevention of forest fires and the protection of game. It is estimated that New Brunswick will receive \$1,500,000 in revenue from the forests during the fiscal year 1920. This includes revenue from stumpage, bonuses, ground rental, fire tax, sale of game licenses and other minor sources, all of which is included in territorial revenue. This figure shows a wonderful increase in the amount of revenue received by the Government of New Brunswick during the last decade, and is not much less than that levied in the large province of Quebec.

Production

During 1918, 439,625 M. feet board-measure of lumber was cut in New Brunswick, valued at \$12,189,312. During that year five pulp-mills were in operation in the province. The kinds and value of wood used were:—

Spruce.	98,729	cords, valued at	\$828,578
Balsam fir.	11,404	“ “	92,276
Total wood used.	110,133	“ “	\$920,854

The kinds and value of pulp produced in 1918 were:—

	Tons.	Value.
Ground wood..	6,463	\$ 155,000
Sulphite..	30,766	2,089,662
Sulphate..	29,390	2,823,994
Total.	66,619	\$5,068,656

Since then production has greatly increased but statistics are not yet available for a later date.

Fire Protection

In the matter of fire protection, the Forest Service recently inaugurated under the authority of the Forest Act has made substantial progress through the permanent forest ranger staff. Fire protection may be separated roughly into three main divisions: (1) the elimination of the causes of forest fires; (2) the detection of forest fires; (3) extinguishing forest fires.



Logs in the Madawaska river.

Under the first division, viz., the elimination of the causes of fires, much has already been accomplished. In this connection the Forest Fires Act of 1918 has had an important bearing on fire protection. Thus in the case of settlers' slash fires, which have often caused disastrous forest fires, the fire law provides that no person may set a fire without a fire permit from a forest ranger. In this way it is possible to regulate settlers' slash fires, as permits are not issued during dry weather when the

fire hazard is great. Out of the 2,000 fire permits issued last season only five fires got out of control, causing extra damage. Of the thirty-six fires started without permits (a penalty of \$200 is provided by law) twenty-eight caused disastrous fires.

A large number of fires have always occurred from carelessness of people who frequent the forests. The Forest Service has tried to interest the public in this matter by issuing circulars and pamphlets concerning fire protection and by posting fire signs in conspicuous places. During the past season about 15,000 fire posters were issued and the school children and boy scouts were instructed in the matter of care with fire when in the woods.

Railways have in the past caused many fires through the escaping of live sparks from the smokestack. The fire law provides for wire netting of standard gauge to be fitted into the smokestacks of all locomotives, steam engines, etc., thus preventing the escape of live sparks. A fire inspector is maintained during the fire season and a part of his duties is to inspect all locomotives operating within the province, so that the fire protective appliances may be kept up to standard. All industrial operations, such as saw-mills, operating within one-half mile of forest land are required to keep screens of a certain standard gauge in the smokestack and refuse burners.

Once a fire has started it is essential that it be detected as quickly as possible so that it may be reached and extinguished while yet small. The interior part of the province contains an extensive area of forest land in which few people travel, so that fires once started might burn for some time before being located. The Forest Service is going ahead with the construction of look-out stations on outstanding peaks where a large area of forest land may be viewed. These stations are connected by telephone and fires are located by range finders and outside points advised by telephone of the exact location of the fire by the look-out man a few moments after it is detected. One look-out was in operation during the past season and was of much value as ten fires were detected and put out before reaching any great size.

Patrols are also necessary part of fire protection. The fire rangers during the dry season are continually patrolling their respective districts. Special patrols are maintained on railways, following behind trains and putting out fires shortly after being ignited. Aeroplanes promise to prove especially useful in this service, providing a means to cover great areas in a short time, to discover from the air fires a great distance away, and to summon assistance quickly. The numerous streams and lakes of the forested areas afford suitable landing-places for seaplanes.

The Forest Service has given special attention to the selection of proper fire-fighting equipment. Shovels, axes, canvas pails, etc., have been purchased and placed at convenient points for use in case of fire. The latest addition to the equipment is a portable fire pump with 1,500 feet of one and one-half inch hose which can be carried by two men through the woods, and has proven very effective for the extinguishing of fires in old stumps, sawdust piles, etc.

Perfect co-operation is very necessary in fire protection so that a fire fighting force may reach the fire as quickly as possible. As the ranger may be in one part of his territory when a fire occurs in another part, the Forest Service has appointed a number of men in each district to act in case of fire and have the powers of an ordinary fire warden; 124 voluntary fire wardens were appointed and authorized to call out men to fight fire when occurring; 60 woods foremen in the employ of private lumber companies were appointed co-operative fire wardens with authority to act in case of fire the same as fire wardens. This co-operation of the lumber companies brought splendid results. In addition 490 road supervisors were instructed to act in case of fire and use their road crews for this work. In this way a force of over 700 men were directly interested in fire protection, and the results secured justify the policy of the Forest Service in continuing such arrangements.

MINERALS AND MINING *

Investigation has shown that New Brunswick is a territory of favourable mineral prospects. All the geological divisions from Pre-Cambrian to Triassic are represented, while those formations such as the Laurentian, Huronian and Cambrian, which elsewhere are usually most productive of metallic ores, and the Carboniferous formation yielding coal and related products, are among those which occupy the largest areas. Moreover, the former have generally been subjected to profound disturbance and metamorphism, conditions most favourable to the occurrence in them of useful minerals. More than twenty-five minerals of economic importance have been discovered throughout the province and many of them have been worked.

The mineral development of New Brunswick is backward, however, the total value of the mineral production for 1919 being only \$1,770,945. That actual mining has not developed to the extent that geological indications warrant is probably due to the general concealment of the rocks by forests, which makes discoveries difficult, so that very little of the province has been prospected. New Brunswick should yet prove a source of great mineral wealth. At present, activities are restricted mainly to the mining of bituminous coal, the quarrying of gypsum and stone, and the production of natural gas and lime.

Coal is found at several places in the broad carboniferous belt extending westward from the coast in Albert and Kent through the counties of Kings, Queens, Sunbury and York, notably near Minto, Grand lake district, at Beersville, on the coal branch of the Richibucto river, and at Dunsinane, thirty miles southwest of Moncton, but it has been worked economically only in the vicinity of Minto. Here the seam runs from sixteen to thirty inches in thickness and is found at various depths down to 120 feet.

Some of the coal is so close to the surface that it is mined by simply stripping the earth cover by means of steam shovels. This process, carried out carefully, adds materially to the production of coal and has been found to be economical. Unless considerable care is exercised, however, there is danger of taking earth or rock with the coal. A very effective method used by one of the operators is to remove as much earth as possible with the steam shovel and then scrape off the remaining foreign matter by hand. For underground work the room and pillar method is generally adopted, although one company is using a mechanical coal cutter and the longwall system.

Since the construction of a railway to Minto in 1914 and the organization of some coal companies with long term leases and a large tract upon which to work, this industry has become important. The following figures give the production of marketable coal from 1912 to 1919 inclusive, with values:—

Year.	Short tons.	Value.
1912.	44,780	89,560
1913.	70,311	166,637
1914.	98,049	241,075
1915.	127,391	309,612
1916.	143,540	386,016
1917.	189,095	708,010
1918.	268,212	1,331,710
1919.	179,108	794,761

Mr. Dowling, of the Geological Survey of Canada, has estimated the contents of the Grand lake coal-field at 138,000,000 metric tons, giving with the addition of 13,000,000 for the areas of Dunsinane and Beersville, a total for the province of 151,000,000 metric tons.

* Revised by the Department of Mines, Ottawa.

Gypsum ranks next to coal among the important minerals of New Brunswick. It is intimately connected with the building industry, large quantities being used in the manufacture of plaster of Paris and gypsum cements, for mortar and architectural decoration. It is also used as a "retarder" in Portland cement. The finer qualities of plaster of Paris are used for pottery moulds, for modelling, and for plaster casts for electrotyping. In a coarse form gypsum is used as a fertilizer on account of its action in promoting nitrification, of liberating potash from the double silicates of the soil, and of minimizing loss of volatile ammonia from stable manure. Finely ground it forms an ingredient of paints, and it is occasionally used as an adulterant of white lead. It is used to a considerable extent for loading paper and in "finishing" cotton and lace goods.

Gypsum is found in several localities, is quarried at Hillsborough and part of the production made into plaster there by the Albert Manufacturing Company. Owing to excellent water transportation facilities, much of the gypsum has been exported crude to mills in the United States. The war, with its restriction of the building trade and shortage of shipping, reacted on this business and reduced production to less than one-fourth of the tonnage mined in 1913. With the coming of peace there was a quick recovery and renewed activity in construction trades promises continued prosperity to this industry. Production figures for the years 1913 to 1919 inclusive are as follows:—

Year.	Quantity mined. Tons.	Shipment. Tons.	Value of Shipment.
1913..	112,739	103,954	\$279,395
1914..	86,912	79,083	200,680
1915..	78,640	74,501	184,929
1916..	53,003	39,546	153,064
1917..	48,396	38,556	191,631
1918..	25,984	27,225	214,114
1919..	52,023	42,409	315,656

Impure gypsum such as that at Plaster Rock occurs in considerable quantities and has been found useful as a fertilizer. Anhydrous calcium sulphate or anhydrite is also found in large quantities but no use for it has yet been discovered.

The natural gas and petroleum produced in New Brunswick all comes from the Stoney creek district, south of Moncton. Production of both gas and oil has increased in recent years and has been of great benefit to Moncton and vicinity, where the gas is largely used for power, domestic heating and lighting purposes. At the present time exploratory work is being carried on in the hope of discovering additional gas or oil fields in the eastern counties.

NATURAL GAS PRODUCTION 1915-19.

Year.	M. cu. ft.	Value.
1915..	430,692	\$ 60,383
1916..	610,118	79,628
1917..	796,775	103,735
1918..	792,396	107,842
1919..	682,890	120,510

PETROLEUM PRODUCTION, 1915-19.

Year.	Bbls.	Value.
1915..	1,020	\$ 1,423
1916..	1,345	2,663
1917..	2,341	5,460
1918..	3,009	7,402
1919..	4,225	13,141



Oil and gas well near Moncton.

Bituminous or oil-shales exist extensively in Albert and Westmorland counties near Moncton, but as yet have not been worked commercially. These shales are richer in oil and by-products than the Scottish shales which have been operated very profitably for many years. The quantity of rich shale is practically unlimited and has been estimated by several mining engineers at as much as 270,000,000 tons. Retorting would have to be undertaken on a large scale in order to be profitable, but under these circumstances the prospects appear favourable.

Tungsten (wolframite) was discovered a few years ago on the Southwest Miramichi river about twenty miles above Boiestown. The property has been worked on a small scale and a certain quantity of concentrates shipped out, but owing to limitations in the plant, its inaccessibility, not being near a railway, the condition of the market and other difficulties, the plant has not been worked since 1917. There evidently was no lack of ore of fairly good quality.

Copper has been mined to a certain extent at various places in the province, notably at Dorchester and at Annidale, in Queens county. A somewhat extensive plant was erected at Dorchester but the mine was never a success and was closed down a few years ago, evidently for lack of ore in sight. At Annidale there is a very good showing of low-grade chalcopyrite, which if found in sufficient quantity, would be valuable.

Iron deposits exist in the vicinity of Bathurst. The ore is a siliceous magnetite, the average iron content being from 43 to 47 per cent with about 0.8 per cent of phosphorus. According to the estimate of E. Lindeman, of the Mines Department, Ottawa, based on magnetometric surveys the ore reserves are placed at 18,600,000 tons to a depth of 500 feet.

Mining operations were started in 1907 and discontinued a few years ago. In all some 180,000 tons were taken out. The ore is too low-grade to be marketed in its natural state, but under favourable conditions and with a concentration process these iron deposits may yet be developed.

Antimony, a metal of many uses, is found near lake George, in York county. It is a constituent of babbitt metal, type metal, "white metal," and solder, and its compounds are used in matches, rubber, paints, and enamels, medicine, colouring matter, and antiseptics. Great quantities of the sulphide are used in rubber manufacture and for this purpose the lake George deposits, which in the past have been mined intermittently, are being opened up by the North America Antimony Smelting Company.

Manganese has been found at a number of places in the province both as pyrolusite and as wad or bog ore. Years ago it was mined very successfully, but no mining of any commercial value has been carried on for a number of years.

Infusorial earth, diatomaceous earth, or tripolite, which is useful as a polishing material and for other purposes, exists in quantity as an organic deposit in Pollet lake, near Anagance, also near St. John and opposite Westfield on the St. John river. This material is not being developed.

Nickel is found near St. Stephen. **Galena** (lead) at Elm Tree, in Gloucester county, and **salt** near Sussex, in Kings County, but none of these are being developed. Mineral water is found at Havelock, Kings county.

Limestone is found at many widely separated points throughout the province but the production of lime is small, being about 500,000 bushels yearly worth about \$225,000. New Brunswick is also noted for its **granite**, building, paving and ornamental stone. The total value of the province's output of stone is about three per cent of that of all Canada.

Most of the Canadian production of **grindstones** and **pulpstones** comes from New Brunswick, notably from Northumberland, Gloucester and Westmorland counties. The Miramichi Quarry Company produce pulpstones and building stone at Quarryville, Northumberland county. In 1918 the total production of grindstones in New Brunswick was 2,816 tons, valued at \$75,005. There is a great demand in Canada for pulpstones, most of which are being imported at present. The prospects of the abrasives industry are promising. Both brick and fire clay are to be found in quantity. The former is being used principally in the brickworks of St. John, but the latter, which exists both in the Grand lake and Beersville coal area, has never been utilized.

Peat bogs are of common occurrence and in several places cover large areas, especially in the southern part of Charlotte county, the adjoining portions of St. John county and in the district bordering on the gulf of St. Lawrence. Notable bogs are those of Spruce lake and point Lepreau, western St. John county, Miscou and Shippegan islands and near the mouths of the Tracadie, Tabusintac, Kouchibouguac and Aldouane rivers. Most of this peat is of the litter variety and is chiefly useful for that purpose.

WATER-POWERS *

In 1918, under a formal agreement between the province of New Brunswick and the Department of the Interior, Canada, water-power investigations involving stream measurement work, profile surveys and storage investigations were undertaken in New Brunswick under the direction of the Dominion Water Power Branch of the



A combination of natural resources—logs and water power.

Department of the Interior, Canada. At about the same time the New Brunswick Water Power Commission was appointed to co-operate with the Dominion Water Power Branch on behalf of the province of New Brunswick in connection with this undertaking.

Hitherto, no systematic survey of the water-powers of New Brunswick had been undertaken, although investigations had been made of a number of outstanding sites by private individuals or corporations and a number of developments had actually

* This section was supplied by the Dominion Water Power Branch.

been made. On international streams such as the St. Croix and St. John rivers, some work had been done by the United States authorities and by the International Joint Commission. The outstanding power site of the province was Grand Falls, on the St. John river, which had been investigated by private corporations and concerning which there had been some special provincial legislation.

It was essential at the outset to secure systematic stream-flow records on the more important rivers of the province. Gauging stations were established without delay and records have been obtained or are now being obtained at the following points:—

Index Inventory Number.	River.	Locality.
1AR ₁	Dana river.....	At Moore's mills.
1AR ₂	Eel Lake river.....	At head of falls, 2 miles from North Head village, Grand Manan.
1AP ₁	Kennebecasis river.....	At C.P.R. bridge at Norton and 38 miles from St. John.
1AQ ₁	Lepreau.....	At highway bridge at mouth of river and near Lepreau station.
1AD ₁	Madawaska river.....	At highway bridge at St. Rose and about 2 miles below Temiscouata lake.
1AQ ₂	Magaguadavic river.....	At Lee Settlement highway bridge near Elmcroft P.O. and 7 miles from Bonny River station.
1BO ₁	Miramichi river.....	At Blackville highway bridge.
1BV ₁	Mispec river.....	About 9 miles from St. John city on highway bridge crossing Mispec river on Black river road.
1AL ₁	Nashwaak river.....	At covered highway bridge about 3 miles above Marysville and near Penniac.
1BK ₁	Nipisiguit river.....	One mile above Grand Falls at Bathurst Mines.
1AK ₁	Shogomoc river.....	Just above highway bridge at mouth of river and about 1 mile from Allendale station.
1AK ₂	St. John river.....	At Hawkshaw bridge about one-half mile below mouth of Pokiok river.
1BJ ₁	Tetagouche river.....	At power-house, 8 miles from Bathurst.
1AH ₁	Tobique river.....	At Arthurette highway bridge.
1BE ₁	Upsalquitch river.....	At railway bridge near Upsalquitch station.

All existing information was compiled and surveys and investigations are being carried out as rapidly as possible. The following tabulated statements of the water-powers in New Brunswick computed in accordance with the standard index inventory system of the Dominion Water Power Branch is the most complete information available:—

Water-powers of New Brunswick.

Number on Map.	Index Inventory number.	Power Site.	Estimated capacity in h.-p. 24 hrs. daily.			Present installation if any.	Remarks.
			At ordinary minimum flow.	Practicable maximum without storage.	With storage.		
1	1AF ₁	St. John river at Grand Falls.....	22,500	59,000			
2	1AQ ₁	Lepreau Lower Falls.....	260	890	1,480		
3	1AQ ₂	Lepreau Big Falls.....	360	1,230	2,050		
4	1AQ ₃	Lepreau Ragged Falls.....	320	1,090	1,840		
5	1BJ ₁	Tetagouche, No. 1 Site, 4 miles from Bathurst.....	90	249	300		
6	1BJ ₂	Tetagouche, No. 2 Site, 6 miles from Bathurst.....	176	486	585		
7	1BJ ₃	Tetagouche, No. 3 Site, 8 miles from Bathurst.....	300	995	1,200		
8	1BJ ₄	Tetagouche, No. 4 Site, at Bathurst Electric and Water Power Co.....	286	793	955	300 h.-p.	Under construction.
9	1BK ₁	Nipisiguit R., Grand Falls.....	3,780	5,000			
10	1BK ₂	Nipisiguit R., Famineau Falls.....	1,020	1,400			
11	1BK ₃	Nipisiguit R., Narrows.....	1,090	1,450			
12	1AK ₁	Shogomoc, near mouth.....	390	1,100			
13	1AK ₂	Pokiok, near mouth.....	136	391	2,800		
14	1AK ₃	Pokiok, above mouth of Little Pokiok.....	236	655	1,045		
15	1AK ₄	Eel R., $\frac{1}{4}$ mile above mouth.....	335	945	2,090		
16	1AK ₅	Eel R., $\frac{3}{4}$ miles above mouth.....	286	810	1,450		
17	1AK ₆	Eel R., 3 miles below Meductic.....	185	525	1,270		
18	1AQ ₄	Maguadavic at pulp-mill.....	732	3,325	1,000	3,000 h.-p.	
19	1AQ ₅	Maguadavic, Second Falls.....	283	1,280			
20	1AQ ₆	Maguadavic, *Indian Rps.....	449	2,040			
21	1AQ ₇	Maguadavic, Long Rps.....	288	1,310			
22	1AG ₁	Aroostook at Aroostook Falls.....	3,410	9,200		6,000 h.-p.	Low figures indicate power avail- able at high tide and high figures power available at low tide.
23	1AR ₁	St. Croix, Union Dam Site.....	450		800	1,275 h.-p.	These estimates based on combina- tion of three existing develop- ments.
24	1AR ₂	St. Croix, Murchie Dam.....	2,090		3,740	725 h.-p.	
25	1AR ₃	St. Croix, Salmon Falls or Cotton Mill Dam Site.....	1,640		2,940	3,600 h.-p.	Under reconstruction.
26	1AR ₄	St. Croix, Baring Dam.....	1,630		2,900	200 h.-p.	Present installation on American side.
27	1AR ₅	St. Croix, Sprague Falls.....	3,260		5,770	14,350 h.-p.	Present installation on American side.

		1AR ₆	St. Croix, Grand Falls.....	3,100	.....	5,520	8,000 h.-p.	Present installation on American side.
28								
29	1AR ₁		St. Croix, East Branch, Canoose Rips.....	1,050	.....	1,850		
30	1AR ₂		St. Croix, East Branch, Steep Bank.....	980	.....	1,780		
31	1AR ₃		St. Croix, East Branch, Little Falls.....	190	.....	340		Somewhat larger capacity can be obtained with extensive embankments.
32	1AR ₄		St. Croix, East Branch, Shaw Tannery Privilege	180	.....	330		
33	1AQ ₃		Head of tide, Musquash river.....	650	2,260	3,460	.....	Under construction.

*"Rips" is a colloquial word denoting a short rapid or ripple.

Early in 1920 the New Brunswick Water Power Commission issued a special report covering the nature of the co-operative arrangement between the province and the Dominion Water Power Branch of the Department of the Interior, Canada, and dealing with three sections of the province to which particular study had been given. The rivers specially dealt with in this report were the Tetagouche, the Pokiok and Shogomoc and the Lepreau, estimates for which are given in the tabulated statement above.



The greatest cataract in habitable regions east of Niagara, the undeveloped Grand Falls.

At the 1920 session of the New Brunswick Legislature, an Act was passed similar to Acts already in force in Ontario and in Nova Scotia under which an independent commission has been appointed to actually carry out the development of certain water-powers. This commission succeeds the former New Brunswick Water Power Commission, which was purely an investigatory body, and is now actively engaged in connection with the developments covered by the special report of the New Brunswick Water Power Commission already mentioned.

FISHERIES *

The most important of the four great fishing areas of the world is situated off the coast of Eastern Canada. Fishing is the oldest of all Canadian industries, antedating lumbering, mining, and agriculture by centuries. Historical records show that long before the days of Columbus, Cabot, and Cartier, European fishermen came to the great cod banks off Canada's eastern coasts. The codfish was the lure which attracted the pioneers and still brings fleets of fishing vessels from Europe annually. But to the fishermen of New Brunswick there are many other varieties of importance. All

*Revised by the Fisheries Branch, Department of Marine and Fisheries.

along its 600 miles of coast, both in the bay of Fundy and the gulf of St. Lawrence, and on the fishing banks farther out, the fishermen of the province are industriously engaged in the catch of herring, cod, haddock, hake, salmon, smelts, mackerel, pollock, alewives (gaspereau), shad, and lobsters, oysters, and clams.

New Brunswick ranks third among the provinces of the Dominion in the value of its fisheries, being exceeded only by British Columbia and Nova Scotia. The value of the fish and fish products marketed in 1918 was \$6,262,197 for sea fisheries and \$36,793 for inland fisheries.

Deep-sea Fisheries

The Atlantic Banks are not so convenient to New Brunswick as to Nova Scotia and Prince Edward Island. Consequently most of this province's fishing is inshore. Some deep-sea fishing is carried on, however, but New Brunswick fishermen visit only the nearby banks in the gulf of St. Lawrence or around the bay of Fundy. They use very small boats for this purpose, which are quite a contrast to the large steam trawlers and fishing schooners used by Nova Scotians, New Englanders, and others on the larger banks farther out. Deep-sea fishermen clean and pack their fish either in ice or salt. The varieties caught are cod, haddock, pollock, hake, cusk, and halibut.

Inshore Fisheries

These are by far the more important in New Brunswick. The method of fishing from boats is the same as on the banks but the large schooners are not required. The varieties caught are similar but include as well, mackerel, shad, herring, gaspereau, smelt, salmon, lobster, oysters, and quahaugs, in all of which boats are employed.

The catch is brought in "undressed," and is cleaned ashore, there to be sold as fresh fish, salted or dried. Two men go in each boat, fishing from two to ten miles offshore for the ordinary varieties caught, and running out to the fishing grounds daily. Most of the fishermen use fast motor-boats twenty to thirty-five feet long.

LOBSTERS

This fishery is confined to the Atlantic coast and is purely inshore. The lobster is caught in traps or "pots," which are usually from 2½ to 4 feet long, by 2 feet wide, and 1½ feet high, and are constructed in the form of a half-cylinder with strips running lengthwise. The ends have a funnel-shaped opening made of netted cord with an entrance ring through which the lobster crawls to reach the bait spiked on the floor of the trap. Once inside the crustacean cannot escape. The trap is weighted and lowered to the sea bottom by a rope attached at its upper end to a wooden buoy painted with the owner's mark. The traps are sometimes set attached to each other by anchored ground lines.

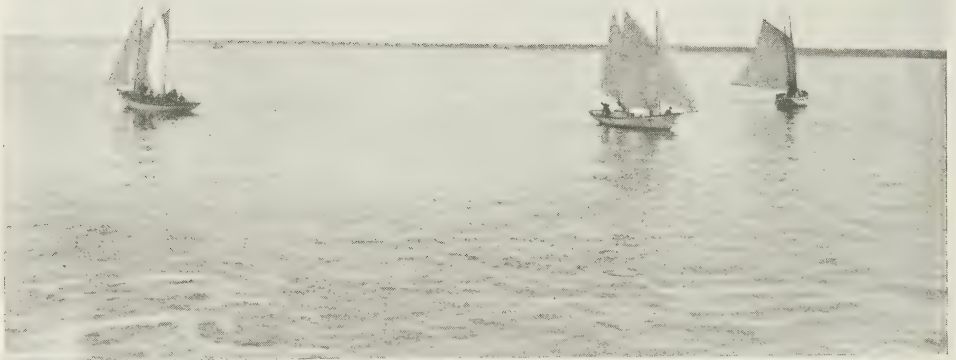
Lobster fishermen set from fifty to two hundred traps and use in tending them motor-boats from twenty to thirty feet in length. Sometimes special hoisting engines are used for hauling the gear, but the majority of lobster-men heave the traps up by hand or with the aid of a winch. Cod heads, small herring, hake and almost any fresh fish are used as bait.

For live lobsters and for those in a boiled fresh state, packed in ice, the United States offers the greatest market, and thousands of crates are shipped from southern New Brunswick during the season. Owing to the distance, points along the gulf of St. Lawrence are unable to ship lobsters in this state to American ports with profit, so the greater quantity caught there is canned.

There are no size limits for the lobster, except in St. John and Charlotte counties, where a length of carapace of 4¾ inches determines the size of lobster which can be legally captured and sold. Soft-shelled and "berried" lobsters, *i.e.*, those in the moulting and egg-bearing stage, must be liberated when caught, and traps cannot be set in less than two fathoms of water

HERRINGS AND SARDINES.

These two important fisheries may be grouped together, as the sardine so-called, in Canada, is really young herring. This fish strikes inshore in enormous quantities during the summer and is captured largely by means of brushwood weirs erected in tidal coves and places sheltered from a rough sea. These weirs are built of stakes driven into the sand from high-water mark seaward, the spaces between the stakes being interlaced with willow or brush. The whole is constructed in the form of a



Salmon boats.

corral or pond with a wide entrance or "shoot" seaward. At high-water, the weir is almost submerged and during the ebb the herring are caught. The fish can then be bailed out or kept alive until required. The well-known sardine fishery on Passamaquoddy bay depends on weirs for the capture of the small herring, which they can as sardines. Great quantities of herring are caught in this manner for use as food, fresh, canned, smoked, boneless and pickled, and many tons are utilized for bait and fertilizer. Mackerel, salmon, shad and alewives or gaspereau are also caught in these weirs.

The possibilities of New Brunswick's sardine and herring industries are immense. The former is being conducted along proper lines with success, but the methods of pickling and curing of herring need improvement. With stricter attention to these matters along lines urged by the Dominion Fisheries Branch, the Canadian herring should compete in the markets of the world on equal terms with the European.

MACKEREL.

The Canadian mackerel fishery is mainly inshore and most of the catch is taken in shore traps. Where fished offshore they are pursued by schooners and taken in purse seines or nets handled from small boats. They are also caught by "jigging" hooks in an area of water in which bait in the form of herring pounded to mush has been thrown. Some seasons this fish is caught in great numbers and others is very scarce. The demand is always greater than the supply.

GASPEREAU AND SHAD.

The gaspereau is also known as the alewife and branch herring, and is caught while ascending fresh-water streams in the spring to spawn. New Brunswick rivers supply a great proportion of the Canadian catch of this fish. The method of capture is usually by dip-nets, drift-nets and weirs. Most of the catch is salted and packed in barrels, but a certain amount is marketed fresh.

The shad is caught in the spring similarly to the gaspereau, whose run up the rivers it follows. New Brunswick leads in the shad fishery, and as this is a favourite food fish of delicate flavour, and very popular in the United States, the industry is of great value.

ATLANTIC SALMON.

The Atlantic salmon fishery is extensively prosecuted in New Brunswick and large quantities are caught at the mouths of the St. John, Miramichi, and Restigouche rivers. These salmon are usually caught in drift and gill-nets from small two-masted boats. Trap and pound-nets somewhat similar to herring nets are also used.

SMELTS.

This fish is caught in the bays and brackish rivers in the winter through the ice. The fishermen construct small huts on the ice from which they fish either by gill or bag-nets or hook and line. These are small fish, but the industry is important to the province.

OYSTERS.

New Brunswick is the largest producer of oysters in the Dominion and has excellent prospects of reviving and greatly developing this industry.

The bivalve is found on mud bottoms in shallow sheltered waters on the gulf of St. Lawrence coasts of the province, usually at the mouth of tidal rivers which flow into estuaries or bays. They are taken either by great tongs which grasp and wrench them from the bottom, or by dredging from gasolene or steam vessels.

The Canadian oyster has a very fine reputation. Dr. Joseph Stafford, who is regarded as the highest Canadian authority on oyster culture, says that the Canadian oyster is superior to any other. After referring to the high reputation of the flavour of the Canadian as compared with the United States oysters, Dr. Stafford says: "Our Canadian oysters took first place at the International Exposition at Paris some years ago. They had to be collected from various places in the Maritime Provinces and during that time they were standing in barrels on wharves, sometimes in the hot sun. After having been subjected to that treatment they had to be transported across the Atlantic and placed on wharves there until the exhibit could be arranged, and yet when placed in competition with European oysters, that had been taken from the water only the day before, they were awarded first place."

Owing to lack of proper methods of conservation and propagation the wonderful natural oyster beds of the province have been in danger of becoming fished out, but a system of farming and oyster culture is now in existence. Under modern methods of oyster farming, great areas of tidal mud on the eastern coast of the province are being planted with seed oysters for future harvesting, and the prospects for a great permanent industry are bright.

CLAMS, QUAHAUGS AND SCALLOPS

These shellfish constitute a valuable asset to New Brunswick. Clams are dug out of the sand and mud flats which are laid bare at low tide. Clam digging is hard work and the diggers get out on the flats and bars as soon as the ebb tide makes. Quahaugs are usually found around the edges of oyster beds and such places. They are dug up with forks attached to long handles, which are operated from boats. Scal-

lops are native to the deeper waters like oysters and are tonged and dredged in a similar manner. Two-thirds of the catch of these shellfish are sold fresh in barrels while one-third is canned. New Brunswick is the greatest producer of these varieties in the Dominion.

COCKLES, MUSSELS AND WINKLES

These shellfish are very plentiful along the coasts but are not gathered to any extent as in Europe. Cockles are dug out of the sand or mud at low water, while mussels and winkles are gathered from the rocks to which they adhere. There should be opportunity for considerable development here.

Although other species than those above referred to find their way to market there is no regular fishery conducted for any of them, as they are taken along with other fish. The men engaged in the coastal fisheries of New Brunswick are exclusively Canadians and residents of the province.



Drying codfish

The following table gives the quantities and values to the fishermen at point of landing, of the chief kinds of fish caught in 1919:—

Kinds of fish.	Quantity.	Value, Fresh.	Kinds of Fish.	Quantity.	Value Fresh.
Salmon.....cwt.	7,873	\$166,371	Halibut..... cwt.	204	\$ 2,990
Lobsters.....“	50,275	569,419	Flounders.....“	1,092	2,579
Cod.....“	151,212	459,092	Skate.....“	35	35
Haddock.....“	8,510	22,119	Smelts.....“	53,703	372,998
Hake and cusk.....“	96,499	138,947	Tom-cod.....“	10,846	16,484
Pollock.....“	52,890	99,071	Oysters..... brl.	7,053	45,849
Herring.....“	315,712	216,016	Clams.....“	15,945	27,961
Mackerel.....“	19,563	78,534	Scallops.....“	20	160
Shad.....“	718	4,535	Quahaugs.....“	1,140	3,320
Alewives.....“	56,584	79,126	Crabs, cockles.....cwt.	2,045	2,4039
Sardines..... brl.	205,435	238,860	Squid (bait fish)... brl.	235	1,077
					\$2,547,946

The sea fisheries are under the care of the Fisheries Branch of the Federal Department of Marine and Fisheries. It enforces close seasons, safeguards the spawning period, and prevents illegal poaching on closed areas. It controls fish hatcheries and the transfer of fry. It also carries on investigations into problems confronting the fish industry and offers advice and assistance to fishermen in the conduct of their operations.

The inland fisheries are largely administered by the Department of Lands and Mines of the Provincial Government. To the extent that they differ from the inshore fisheries they are confined almost entirely to angling for the purposes of sport, and are dealt with under the section devoted to hunting and angling.

HUNTING AND ANGLING *

New Brunswick has always been famous for its big game. From the early days of the French occupation the great attraction of the country has been the abundance of wild animals, and it is still a veritable game preserve although one of the first sections of North America to be colonized. The secret of this is found in the retention of the forests, in the enactment and enforcement of wise game laws, and in an intelligent appreciation on the part of the people of the value of the game interests as an asset to the province. No province or state is more justly famous to-day for the amount of big game in its forests than is New Brunswick.

During the open season of 1919 some five hundred licenses for big game were sold to non-residents and fifteen thousand to resident sportsmen. The number of moose killed and reported during that season was 1,430 and the number of deer 2,416. The number of non-resident hunters during the fall of 1920 was greater than the previous season, and although the number of deer shot, 2,480, was greater than last year, the number of moose shot, 1,275, was considerably less. The revenue from the sale of hunting licenses is used almost exclusively for forest and game protection, and the results have been highly satisfactory from the standpoint both of the sportsman and of the preservation of the game.

A Game Refuge in Northumberland county consists of 400 square miles, where all forms of game are safe from molestation. This refuge ensures the preservation from extinction of all varieties and keeps the surrounding forests where hunting is permitted always well stocked.

Lines of railway tap every county in the province and the most remote sections are but a brief journey from the large cities of the Eastern and Middle States and Central Canada. The service on these railways is first-class in every particular and the officials will be found ever courteous and ready to supply information to travellers.

Moose

The moose is generally conceded to be the finest game animal in America and nowhere—Alaska alone excepted—can better specimens be found than in New Brunswick. Here the cows have been protected by law for many years and the result has been very satisfactory. These animals have increased in number to a surprising extent in recent years and to-day there are thousands of them roaming in the woods where twenty-five years ago there were but hundreds.

Caribou and Deer

The caribou, which is a smaller animal than the moose, and is similar to the reindeer of Northern Europe, was also fairly abundant at one time, but is at present somewhat scarce, so much so that it has been found necessary to put a temporary embargo upon the shooting of it. Unlike the moose which leads a more or less solitary

* The information in this section was furnished by the Department of Lands and Mines, Fredericton, N.B.

life, caribou are usually to be found in herds, which roam about from place to place in search of the food they most prefer. The ban on hunting caribou is in force till September, 1921.

The Red or Virginia deer is found practically all over the province, and is so plentiful as to become in some sections something of a nuisance on account of the raids it makes upon the farmers' crops.

Fur-bearing Animals

A considerable variety of fur-bearing animals are also to be found in the New Brunswick forests, among which may be mentioned the bear, raccoon, wolverine, marten, mink, otter, beaver, lynx, wild cat, muskrat, squirrel, and wood chuck. Hares also are found in great numbers all over the province. This animal turns white in winter. Bears are found chiefly in the less frequented parts of the forest, and they are somewhat shy, rarely showing fight unless it be a she-bear in defence of her offspring.

Wild Fowl

New Brunswick has also and deservedly a great reputation for feathered game. Wild geese are fairly abundant, and there are six species of wild ducks, besides brant. The great haunts of wild geese and of brant are on the north shore, but wild ducks are to be found on rivers all over the province. There are two species of partridge, although the proper designation of this bird is grouse. The ruffed grouse, which have been protected for the last few years, are getting very numerous again and an open season will shortly be allowed for these birds. Curlew, plover, snipe and woodcock are also to be found and afford admirable sport. The great northern diver or loon is to be found in all the great rivers. In addition to these, there are two species of eagles, five species of hawks, and four or five varieties of owls. These are but a few of the birds of New Brunswick of which there are about two hundred species in all. A splendid collection of them can be seen in the museum of the university at Fredericton.

The care and management of all migratory birds, including geese, brant, teal, black duck, shore birds, snipe, and woodcock, has passed into the hands of the Federal Government. The shooting of sea-gulls, pheasants and small birds frequenting fields and woods (except blackbirds, crows and English sparrows) is prohibited at any season.

Guides

There are three hundred registered guides in the province, half of whom are camp owners who hire other guides not owning camps of their own, but who are good woodsmen, hunters, and guides. As each party has its own district there is little danger of accidents in the woods. Camp owners furnish complete outfits excepting guns and ammunition. A list of these guides may be obtained from the Crown Lands office at Fredericton.

Angling

Besides being a land of big game and wild fowl, New Brunswick has much to offer the sportsman who enjoys using the rod as well as the rifle and shotgun. Many varieties of fish abound in the inland waters of the province, the chief being salmon, trout, bass, chub, perch, pickerel, eels, landlock salmon and whitefish.

Some of the larger rivers, such as the Restigouche, Miramichi, Tobique, Upsalquitch, and Nipisiguit, are famed for their salmon fishing and in fact have few superiors in the world so far as this royal sport is concerned.



Giant moose shot in a New Brunswick forest. Trout stream, Sussex. Hopewell rocks.

While salmon fishing has many staunch devotees, it is generally conceded that trout angling is a sport more generally enjoyed. New Brunswick is noted for its excellent trout, having such a large number of lakes and streams far from settlements and beyond the reach of the small boy. There is excellent fishing to be had on the Nipisiguit river above the falls, and also on Green river. The lakes above the town of Campbellton also afford fine trout fishing. Easier trips which can be made at less expense will be found in the vicinity of Skiff lake and of the Tabusintac, Bartiboque, Pokemouche, Charlo, and several other streams.

Game Regulations

Features of the game laws of New Brunswick of special interest to non-resident sportsmen are briefly as follows:—

The open season for moose and deer is from September 15 to November 30. Non-resident license fee for hunting same is \$50. This license permits the holder to shoot one bull moose and two deer. The shooting of cow or calf moose is prohibited, as is also the hunting of moose and deer with dogs. The hunting of moose or deer by means of "Jack-Light" or traps or snares is also prohibited. No non-resident shall enter the woods of the province to hunt without a registered guide, and such guide must be a bona fide resident of the province. It is unlawful to hunt or kill game on Sunday under double penalty. It is unlawful to carry firearms in the woods during the close season without a special permit. When a person has killed a moose, he must bring out the head and affix thereto a tag, stating by whom it was killed, and the number of his license, and forward a duplicate of such tag to the Department of Lands and Mines at Fredericton. No game head is to be shipped without a tag being attached thereto. The carcass of game or parts thereof cannot be taken out of the province without a permit issued by the above department. Bird licenses are issued to non-residents on payment of a fee of \$10. Fishing licenses are issued to non-residents for a fee of \$25 for salmon and \$10 for trout angling.

Reliable information as to hunting, fishing and canoeing trips, guides, etc., in New Brunswick can be obtained by addressing any of the following: Deputy Minister of Lands and Mines, Fredericton; Chief Game Warden, Fredericton, N.B.; President N.B. Tourist Association, St. John, N.B.; Secretary N.B. Guides' Association, Fredericton, N.B.

FUR-BEARERS AND FUR FARMS

The same conditions which make game so plentiful afford great opportunities for the trapper. The principal animals of the province whose fur is valuable are black bear, fox, lynx, beaver, raccoon, sable, marten, mink, otter, and muskrat. The recent great rise in the value of furs has made trapping particularly profitable and has also provided an impetus to fur-farming.

The success achieved in the raising of foxes in the neighbouring province of Prince Edward Island was instrumental in the development of the industry in New Brunswick. To-day there are many fur-farming companies established in the province with a total capitalization of several millions of dollars. The Provincial Government has enacted legislation to protect and further the interests of this industry.

The control of these animals in captivity is now fairly well understood, so that the industry may be regarded as on a stable basis. For some time, however, this was not the case and many foxes died from causes we now know to be preventable. Confidence is therefore returning to the business which in capable hands may be fairly regarded as a profitable undertaking in New Brunswick.

Statistics as to animals caught, furs marketed and fur farms in the province will not be available until next year, when they may be obtained from the Bureau of Statistics, Ottawa, or the Department of Lands and Mines, Fredericton.

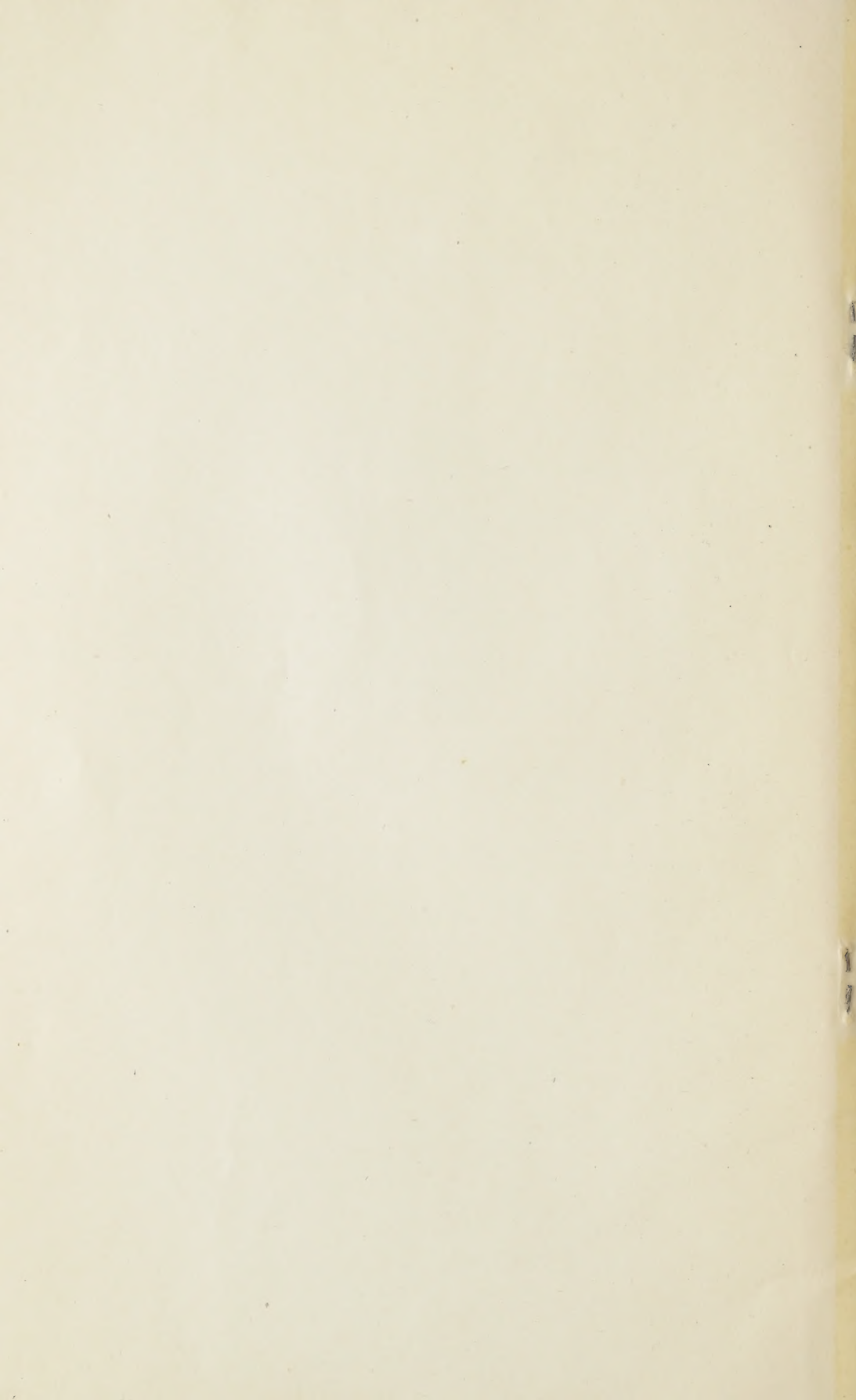
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Inquiries relating to
the natural resources
of the Dominion of
Canada will be given
prompt attention if
addressed to:—

The Superintendent
Natural Resources
Intelligence Branch
Department of the
Interior, Ottawa.



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